THE ARCHITECTURAL RECORD

1936

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THE
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VOLUME 80 NUMBER 1 JULY, 1936

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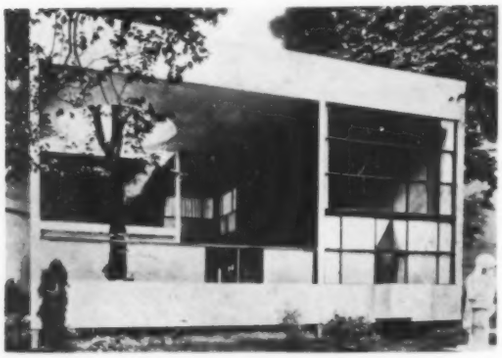
THE ARCHITECTURAL RECORD

VOLUME 80 • NUMBER 1 • JULY 1936

• NEXT • MONTH •

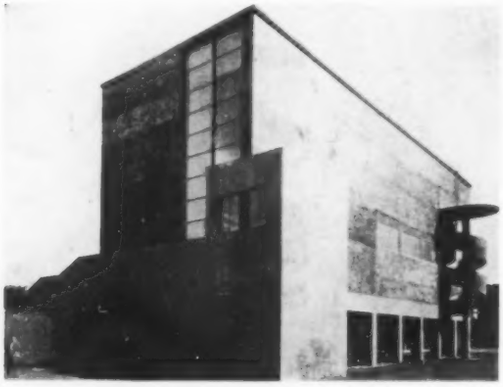
SPECIAL ISSUE ON STORES AND OTHER COMMERCIAL BUILDINGS

DATA FOR PLACING AND PROPORTIONING RETAIL STORES AND SERVICE ESTABLISHMENTS IN A RESIDENTIAL COMMUNITY. By Howard W. Green • PLANNING: The Men's Shop, Specialty Shops for Women • FEATURED SHOPS AND BUILDINGS: Washington Branch, Corn Exchange Bank Trust Company, New York City—Fellheimer and Wagner, architects . . . Office Building for the Upjohn Company, Kalamazoo, Michigan—Albert Kahn, architect . . . Lincoln Theater Building, Miami Beach, Florida—Robert E. Collins, architect; Thomas W. Lamb, consulting architect . . . Union Bus Station, Jacksonville, Florida—W. Kenyon Drake, architect . . . Hahn Store, Washington, D. C.—Pioso, Peterson and Associates, architects . . . Market Building, California—Van Pelt and Lind, architects . . . Julius Kayser Store, New York City—Edward I. Shire, architect . . . TVA Stores • TECHNICAL NEWS AND RESEARCH • NEWS OF THE MONTH • BUILDING TRENDS



Pavilion de L'Esprit Nouveau
Le Corbusier, architect

1925
PARIS
FRANCE



Pavilion of City of Brno
Bohuslov Fuchs, architect

1928
BRNO
CZECHOSLOVAKIA

Pavilion, Associated Workers' Press
Hans Schumacher, architect

1928
COLOGNE
GERMANY

Pavilion of German Republic
Mies van der Rohe, architect

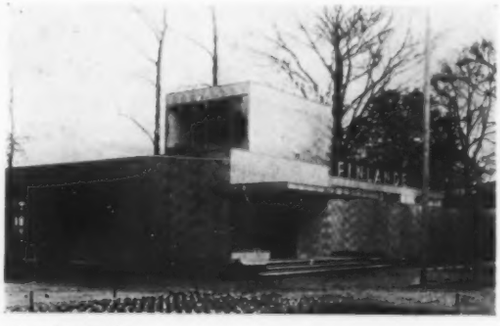
1929
BARCELONA
SPAIN

THIRTEEN YEARS OF FAIR-BUILDING REVIEWED IN CURRENT EXHIBIT

Fairs are as old as civilization; but great expositions are the phenomena of modern industrial society. Beginning with the London Fair of 1851 expositions have seen a steady development in size, complexity, and frequency. Since the World War they have become annual affairs of increasing scope. Planned for the near future are many on a scale not heretofore attempted—1937 International Exposition at Paris; 1939 World's Fair in New York; and the San Francisco Bay Exposition, 1939.

The social and political importance of these expositions can no longer be ignored: and the problems they raise for the designer demand a more progressive approach than heretofore. To place these problems before the designers of New York's World's Fair, the Museum of Modern Art last month opened a small and not exhaustive exhibit of recent expositions and issued a bulletin by Henry-Russell Hitchcock, Jr., on the development and significance of the modern exposition. The exhibit, according to the Museum, "is intended briefly to show the success with which the modern idiom has been expressed in Fair architecture and the flexibility with which it lends itself to various uses. Emphasis has been placed on unity of design and coherence of planning rather than on social implication. The Stockholm Exposition makes explicit what becomes apparent in a study of these expositions: that a Fair planned with a strong central theme, one related to man's needs in modern civilization, will probably result in a Fair logically planned, homogeneous in style and of contemporary value." (Photos from Museum Exhibit.)

1930
ANTWERP
BELGIUM

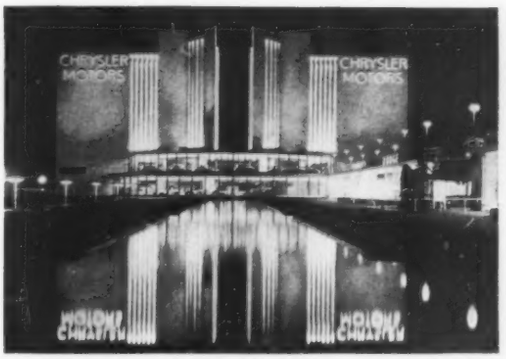


Finnish Pavilion
Erik Bryggman, architect

Musical Instrument Pavilion
E. Gunnar Asplund, architect

1930
STOCKHOLM
SWEDEN

1934
CHICAGO
ILLINOIS



Chrysler Motor Building
Holabird and Root, architects

Electrical Pavilion
Figini and Pollini, architects

1930
MONZA
ITALY

1935
BRUSSELS
BELGIUM

Czechoslovakian Pavilion
Bohuslov Fuchs, architect

Building Materials Exposition
Mies van der Rohe, architect

1931
BERLIN
GERMANY

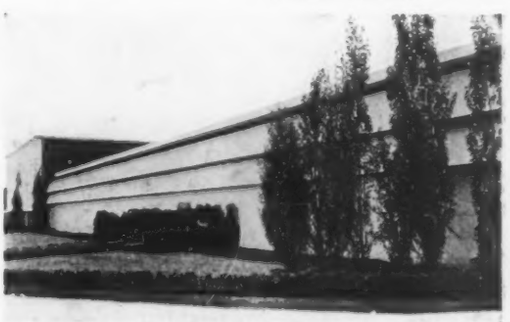
1936
DALLAS
TEXAS

Magnolia Oil Company Pavilion
William Lescaze, architect

Press Pavilion
Luciano Baldessari, architect

1933
MILAN
ITALY

1936
CLEVELAND
OHIO



Hall of Progress

NEWS OF THE MONTH

Wide World Photo

NOT WAR BUT PEACE

Nowhere is the close similarity between modern instruments of construction and destruction more clear than in scenes like this: a jackhammer crew at work on the Grand Coulee Dam site in the Pacific northwest.

"THE WHOLE BOAT GIGGLES FROM STEM TO STERN"

The English super-liner, "Queen Mary," which made her maiden trip to this country last month, has been the cause of heated controversy in English architectural and decorating circles. The work of the huge staff of professionals and craftsmen who took over the "Queen Mary" when the naval architects had finished has not met with the approval of all critics. Serge Chermayeff, F.R.I.B.A., writing in *The Listener*, says:

"The beauty of the ship, her gracile slenderness, as one looks along her tapering and swelling hull from some point exactly in front of the bows, or, as seen from the opposite bank, her precipitous side-on splendor, is so satisfying that the seeker after beauty, who has no intention of crossing the Atlantic, may be advised to go no further. Inside waits disappointment. And yet nine-tenths of the interior would have been well enough, and something more than well, if only the people who settle these things could have let it alone. The ship is lined in wood as a ship should be, lined with veneers of every texture and color, ordered as often as not with considerable taste. But the good wood surface has been broken up and disfigured with what business men call 'art.'

"They will be calling us highbrows next"

● "It was decided by those who decide these things that the 'Queen Mary' should be decorated. The experiment might have been interesting. There are plenty of serious artists in England, some of whom are not only serious but gifted. To what extent they are gifted for decoration on the grand scale we do not know. Here was a chance of putting them to the test. Gifted and serious artists, however, do not commend themselves to a certain kind of business man, and assuredly the men who ordered and interfered with the decoration of the 'Queen Mary' are of that kind. So, any serious artist who has had the misfortune to be stumbled on by the management has, it seems, been diverted from his or her natural bent; has been hampered by stupid and ignorant instructions, and, when all else failed, has had his or her achievement stultified by a crushing inappropriate setting. About the wholly or partially frustrated efforts of these artists I shall have a word to say presently; but neither they, nor the veneer-setters, set the tone of the boat. That is set by the 'management,' and what the management wants, and gets, is the humoristic-artistic. That is the prevailing note: the Teddy Bear style. Nothing is suffered to be merely good-looking, it must be funny as well; which means that hardly anything is good-looking, and that almost everything is vulgar. The managers, having voted recklessly for decoration, have been overtaken by terror lest they should be accused of a taste for art—'they will be calling us highbrows next.' To escape this deadly impeachment they have decided to make a joke of it. The decoration of the 'Queen Mary' is facetious.

Comic strip raised to the power of one hundred

● "To name the persons who have disfigured this beautiful ship with their titterings in paint, wood, glass, plaster and metal, would be invidious, and is, fortunately, unnecessary. Their doings may be compared with those of the mosaicists—almost all of them—who have defiled the glorious interior of Westminster Cathedral; happily these are not indestructible. The better of them—those that titter least are merely feeble, the worse are quaintly vulgar. They do not matter; it is the prevailing mood that matters; and this, we may take it, was inspired by the management. The artistico-comical creeps all over the ship, and proclaims the frivolous and frightened attitude to art of rich people who are not sure of themselves. The whole boat giggles from stem to stern. Even the modest unpainted studio, a small room provided with a piano for practice, has not escaped the infection: the carpet, the very windows, are prettified with treble clefs, crotchets and quavers. In the gymnasium are comic boxers, in the cabin nursery . . . but the cabin nursery will not bear remembering. There is something peculiarly depressing about a comic strip raised to the power of a hundred.

They should have left the wood alone

● "The answer to this criticism is, no doubt, that the company knows what its customers like. I wonder. It may be so, but, like Malvolio, I think more nobly of the soul. It is significant, perhaps, that the 'tourist' (second) class apartments are much to be preferred to the 'cabin' or first. Here both veneer and glass have been used with surer and more consistent taste and with better effect. You cannot expect much business man's art for a second-class fare. But, considering the interior as a whole, I do believe, if the business men could not leave the wood alone—which, being business men, they could not—they would have done better to hand the ship over to some large firm of upholsterers, who would have fitted it out in any style of period-plenishing from Middle Minoan to Art Nouveau."

PRIVATE CAPITAL TO TRY SUBSISTENCE HOMESTEADS

Entrance of private industry into the field of subsistence homesteads was forecast in a statement by FHA's Stewart McDonald last month, when he announced the President's "enthusiasm" over a plan to extend FHA mortgage insurance to such projects. The plan aims at a gradual movement of industrial workers from urban and suburban areas to small homes on one- and two-acre plots several miles from city limits. "Movement into these areas should be encouraged in every possible way," according to McDonald, "because it will relieve congestion within the cities and will enable people to raise produce in their own gardens."

The entrance of FHA into the field of subsistence homesteads marks another step in the New Deal's efforts to put into effect a program of decentralization of the industrial population.

18 SUBSISTENCE HOMESTEADS NOW COMPLETE

18 of the 33 projects transferred to it from the Division of Subsistence Homesteads last year have been completed by Resettlement Administration, according to an RA report. This brings to a total of 1,436 the number of families provided for: with the program complete, 2,761 families will have been cared for. Although it is felt in many quarters that, due to widespread rural distress, Federal relief measures should be expanded, a recent decision of the Federal Appellate Court threatens the entire RA program (*see News of the Month*, May 1936).

Wide World Photo

GARMENT WORKERS PICNIC PREMATURELY

200 garment workers and their families held a picnic at RA's new project at Hightstown, N. J., last month to celebrate the occasion and inspect their future homes. They were premature: the project, along with the entire 1935 Relief Act, was declared unconstitutional the next day. The $1,800,000 "greenbelt town," scheduled for completion around June 15, may be finished with funds already allotted.

PWA SUCCESS STORY

According to H. M. Lane, president of the Alta Vista Housing Corporation, all you have to do to put your town on its feet is to start a housing project; at least, the phenomenal growth of Alta Vista, Virginia, is attributed in part to the impetus furnished by the PWA limited-dividend project.

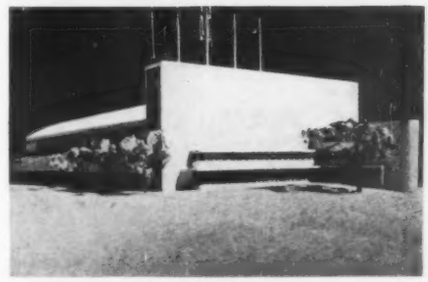
Because of totally inadequate housing "industries in the town had been unable to attract the right kind of workmen." The Housing Corporation completed 50 houses in September 1934, which rent for between $3 and $4 per house per week. Demand for these houses reached a high point last month when one vacancy brought 49 applicants. The Corporation is contemplating additional structures.

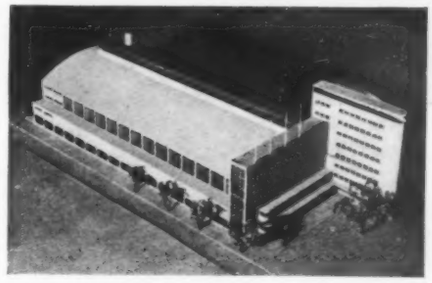
HINDU ART "SAVED" BY AMERICAN TOBACCO

When Doris Duke, heir to the Duke tobacco millions, visited India last year with husband James Cromwell, she was much taken by India's ancient art of marble inlay. Forthwith she ordered a series of marble panels inlaid in floral designs with jade, cornelian, lapis lazuli, mother-of-pearl and other semi-precious stones. These panels are to deck a bedroom and bath in the new Cromwell mansion in Palm Beach, Florida. The order, which occupied many craftsmen for months, is a break for the nearly extinct industry, and several maharajahs, "stirred by the Cromwells' patronage of a dying art," are considering following their example by engaging the newly discovered craftsmen. The Cromwell order is said to be the biggest since the days when emperor Shah Jahan built the Taj-Mahal for his leading woman.

ONE ITEM THE DESIGNERS FORGOT

The famous vegetable garden atop Rockefeller Center, New York City, now boasts a scarecrow. According to A. M. Van Den Houk, horticulturist at the Center, the city sparrows so took to the seeds in the skyscraper garden that a scarecrow was felt necessary. After a trip through New Jersey and Connecticut in search of a horrendous model, Mr. Van Den Houk found it was the rush season for scarecrows and was forced to construct his own from clothing bought at a local Salvation Army office. The scarecrow, complete to a flower in its buttonhole, now keeps away the "absolutely brazen" birds.





Photos courtesy of Bauwelt

FINLAND PRE-PLANS FOR EXPANSION

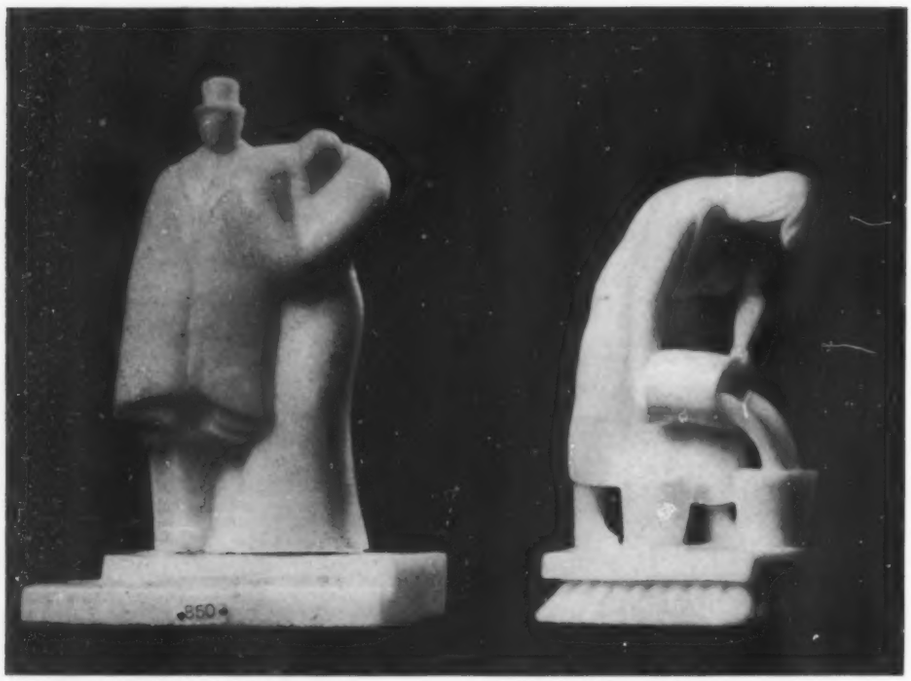
The new city market hall of Helsingfors has been pre-planned for expansion. To the present structure (1) will be added later a six-story bank of exhibition rooms (2) the blank walls of which will be used for advertising. At a still later date it is planned to add an eight-story office building (3) to the right of the exhibition rooms. The architects are A. Hytönen and R. V. Luukkonen of Helsingfors.

Architecture D'Aujourd'hui

AN INTIMATE VIEW OF "DER FUHRER"

An unusual view of the dining room in Adolf Hitler's Bavarian retreat. Nowhere is the reaction of the third Reich better exemplified than in its domestic architecture with its use of sloping roofs, hand-painted china, peasant-inspired furniture, and hand-embroidered pillows. Notice the figure of a Storm Trooper at the top of the chandelier.

NEWS OF THE MONTH



1. "Opening Night," by Helen Beling. 2. "Scrub Woman," by Duane B. Bryers

CLASS CONTRASTS IN SOAP

Running the gamut of subject matter (from animals to religion), entries in National Soap Sculpture's Twelfth Annual Competition have been judged and are now on exhibit in Rockefeller Center. The two entries shown above are first and second prize winners in the "advanced amateur class." The exhibit will later tour the country.

DEAD ARCHITECT TO ATONE FOR MISTAKE

Photo by Zimmerman

New York's Public Library never satisfied its architect.

So conscious was Thomas Hastings of the errors of his youth that when he died in 1929 he left a fund of $100,000 to atone for them. Hastings, together with his partner John M. Carrere, was designer of New York's Public Library. The commission, which came as the result of a long and rather novel competition, had never fully satisfied architect Hastings. Before his death he was aware of what he considered errors in the design of the building and resolved that they should be corrected. The fund which he bequeathed for this purpose only became available with the recent death of his wife.

The Fifth Avenue portico was what bothered Mr. Hastings. Although he refused to release them he had long before his death completed the plans for the remodeling of the portico. He felt that the entrance was too heavy and, if his plans are carried out, the pediment will be brought forward and supported by eight Corinthian columns instead of the six columns and two piers which now support it.

This revision will bring the Library even closer to Fifth Avenue, a point which Mr. Hastings fought spectacularly before the Library was built. The legislative Act which made the erection of the Library possible was so worded that the building had to occupy the site of the old Reservoir on Fifth Avenue. Mr. Hastings, architectural composition in mind, proposed that instead it be placed on the Sixth Avenue side with all of Bryant Park developed as approach.

But Mr. Hastings' proposal went down to defeat. Jacob Riis, well-known figure of the time, raised the cry "Save the parks for the people." The newspapers made the issue a popular one although the park about which they were fighting was "associated in the popular mind with waste paper, beggars, and unemployment." The Bill went through as originally drafted and, later, the competition for the building was won by Carrere and Hastings.

Ironically enough, Bryant Park, as redesigned by the WPA last year, forms the approach to the back of the building which Mr. Hastings so desired for the front.

TREASURY DEPARTMENT SELECTS SCULPTORS

Two sculptured models—one of Noah receiving from the dove the good news that the flood would subside, the other of a mother and child receiving a message from an absent family member—have won for their respective owners a $7,500 commission. Two models, part of the 400 entered in the competition of the Treasury Department's Painting and Sculpture Section, will be developed into sculptures to ornament the Bronx (N. Y.) Post Office.

Charles Rudy, New York sculptor, and Henry Kreis, Essex, Connecticut, winners of the competition, will transfer their designs onto white marble blocks, 4′ x 14′ in size. In executing the sculptures, such alterations as may be necessary to harmonize the designs will be made.

Wide World Photo

RAIN WATER RUNS UPHILL IN NEW ORLEANS

Because the Creole City is lower than the Mississippi River, and because the water-table is being lowered even more, all storm water must be pumped out. For this purpose the city maintains an elaborate system of canals and pumping stations which drain into Lake Pontchartrain. Shown above is a new canal being constructed with PWA funds.

Main Elevation

KEALLY-LIVINGSTON DESIGN WINS OREGON COMPETITION

The $132,000 commission for designing the proposed Oregon State Capitol was last month awarded to Francis Keally and Goodhue Livingston, New York architects. Besides the winners of the competition, in which some 123 designs were submitted (at an estimated production cost of $100,000), five runners-up were awarded a $1,500 prize. They are: Wesley Sherwood Bessell of East 52nd Street, New York; de Young and Moscowitz of 205 East 42nd Street, New York; John A. Thompson and Gerald A. Holmes of 101 Park Avenue, New York; Walter T. Karcher and Livingston Smith of 1520 Locust Street, Philadelphia.

Mr. Keally, well-known designer and prominent in competition work, is a graduate of the University of Pennsylvania. Five years ago he won the competition for the pioneer monument at Harrodsburg, Kentucky.

Mr. Livingston, who is a graduate of the Columbia School of Architecture, is a member of the firm of Trowbridge and Livingston, designer of many financial institutions in the east, including the J. P. Morgan Building and the Mellon National Bank in Pittsburgh.

CONFERENCE TO DISCUSS CHURCH ARCHITECTURE

The North American Conference on Church Architecture will meet October 9, 1936, at the Cathedral of St. John the Divine in New York City. The conference, which will be devoted to discussions of modern problems in church architecture, is open to all architects, designers and builders. Among the speakers tentatively accepting are the Rt. Rev. Bishop William T. Manning; Dr. Ralph Adams Cram, architect; Dr. Francis Onderdonk, University of Michigan, who will speak on ferro-concrete construction in churches; Professor Leopold Arnaud, School of Architecture, Columbia University.

LORD OF SAN SIMEON JOINS FAIR BOARD

William Randolph Hearst, publisher, was among the 35 men added recently to the Board of Directors of the San Francisco World's Fair of 1939.

CONTROL OF STRUCTURAL PESTS NOT ARCHITECT'S JOB

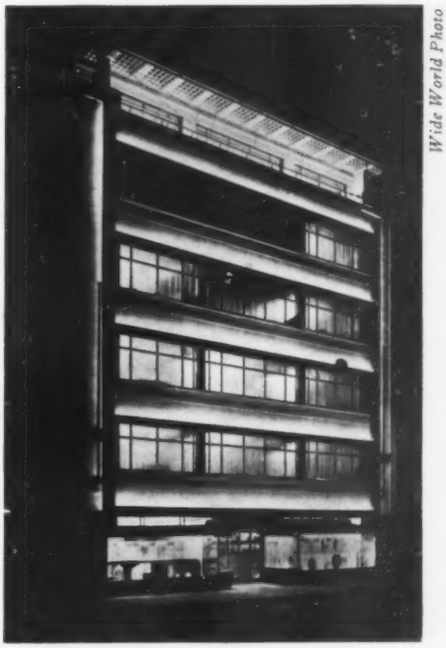
As modern construction becomes increasingly complex the architect finds his field increasingly invaded by specialized technicians. This trend in California has recently taken the form of a discussion between the State Pest Control Board and the architects. The Board, set up under the Structural Pest Control Act, is designed "to safeguard the public by requiring that those persons who apply chemicals be cognizant to the danger of human life in the improper use of insecticides, fumigants, or allied chemicals."

Glen V. Slater, Register of the Board, writing in the *Architect and Engineer* for May, points out that the registration laws for architects and engineers do not permit the practice of any profession other than that for which the architect or engineer is specifically certified, registered, or licensed. Control of structural pests, according to Mr. Slater, is not included in the planning and designing of buildings: "Certainly, if it had been intended that the control of pests was the function of the architect and engineer, such would have been included in the definition recited in each Act." Precautionary measures against structural pests in buildings under construction are one thing: the right to advise or specify the use of chemicals or poison to rid an existing structure of pests is quite another, according to Mr. Slater.

The spread of the termite in this country has been both recent and rapid, but already the exterminating field is a highly competitive one with a rapidly broadening technique. Standardization of chemicals has already been taken care of in California by its Economic Poisons Act. Standardization of methods is the object of the Pest Control Act. Licensed exterminators are the means by which the latter objective is secured.

LEON SOLON AGAIN MEDALIST

Léon V. Solon, secretary of The Architectural League of New York, has been awarded the "President's Medal" of that organization for his "intelligent building up of the League's prestige."



Wide World Photo

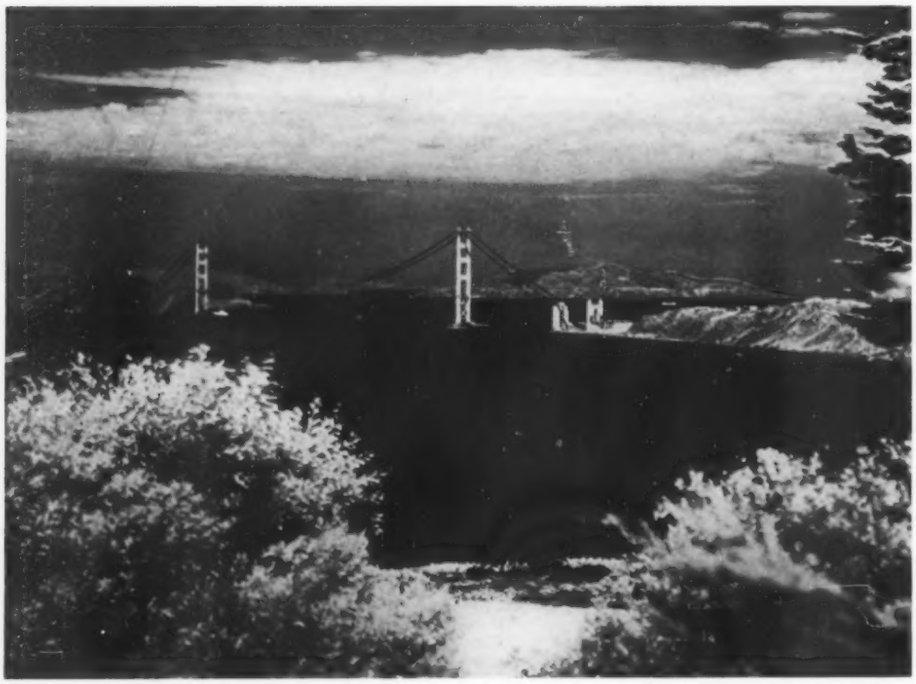
FOR (RICH) MEN ONLY

A new store for men recently opened in London. The structure, which has 9 floors, is designed for merchandise running from trout flies to small aeroplanes, cocktails to evening clothes, all of which are appropriately displayed. The indirect lighting of the façade is achieved by vertical and horizontal troughs. Notably absent are eye-jerking advertising signs. Joseph Emberton, architect.

THEY STILL WANT TO SEE NIAGARA

Free information for tourists is dispensed at the new Bureau designed by Henry Dreyfuss for Socony-Vacuum Oil Company in New York. The color scheme of blue-green and white, with brilliant red accents, is executed in linoleum. Officials of the Bureau say that marked maps to Niagara Falls are still most in demand.

NEWS OF THE MONTH



Wide World Photo

A THING OF BEAUTY

Engineering design reaches new heights of beauty and daring in the Golden Gate Bridge now nearing completion in San Francisco. The structure is the largest suspension bridge in the world. The 36-inch cables are being spun in place.

WORLD'S FAIR SITE OFFICIALLY DEDICATED

Wide World Photo

On the marshes "the expanding life of the future" will rise.

On a rainy night last month, atop a huge ash-pile, Grover Whalen, president of World's Fair Corporation, officially dedicated the Flushing Meadows (N. Y.) site with a bottle of champagne. Speechless and informal though the ceremony was, it initiated a period of great activity for the proposed Fair.

Board of design named

A board of seven, consisting of architects, industrial designers, and engineers to plan and supervise construction of the Fair, has been appointed. Stephen F. Voorhees, A. I. A. president, has been named chairman; Gilmore Clarke, William A. Delano, Jay Downer, Robert D. Kohn, Walter Dorwin Teague, and Richmond H. Shreve complete the staff. The function of the Board will be to prepare and submit to the directors a general plan of the Fair, including the definition of the main theme, limitations of heights and areas for structures, general architectural characteristics including color and light. Mr. Teague, industrial designer, is the only "modernist" on the Board. The Board of Design will work for exhibitors and not for the Fair Corporation. However, the individual designs of the Board members must be approved by the entire design board.

Design workshop established

The new Board of Design will have as its workshop the greater part of the 80th floor of the Empire State Building. The area has never been occupied except for the offices of John J. Raskob and Pierre S. DuPont "who had the southern exposure." Until further expansion is required the Design Board and its staff will work here.

Must have social objective

The "Fair of the Future Committee," an advisory board which advocates advanced design (see *News of the Month*, April 1936), dined last month with the Fair's Advisory Board. In submitting its report, the committee expressed the belief "that the most important question connected with the Fair is the story it will attempt to tell."

"We believe," it said, "that the progress of the Fair must have an underlying social objective. It must demonstrate that betterment of our future American life which may be achieved only through the coordinated efforts of industry, science, and art." The traditional scheme of planning a fair as a number of separate and unrelated structures devoted to machinery, science, transportation, agriculture, etc., should be abandoned, according to the committee, as "such an obsolete arrangement fails to relate the exhibitions to daily life.

"Our plan calls for nothing less than turning the old-fashioned fair inside out and building it around the visitor, rather than leaving the visitor outside to penetrate it only as far as his strength permits. Once within the fair grounds he should find himself led immediately to the heart of the exhibit." The committee suggested no particular architectural style. "If this theme of the expanding life of the future controls the whole plan of the Fair," it asserted, "we need not worry about its architectural style."

NEW BUILDING MATERIALS DISPLAY OPENED

A permanent display of architectural building materials was opened last month at the Procurement Division of the Treasury Department at Washington. The major purpose of this display is to provide a technical reference library of materials for the convenience of both federal and general architects, students of technical universities and manufacturers, to which they may turn for exact information as to form, color, texture and other properties in connection with the design and construction of Federal buildings.

The exhibit is limited to commercially and competitively available American products and every geographical area in the continental United States and Alaska is represented.

COLUMBIA HONORS "QUEEN MARY" DESIGNER

Among the 4,432 receiving diplomas at Columbia University last month was one Stephen Joseph Pigott. Mr. Pigott, member of the 1930 engineering class, was awarded an honorary degree for his work as naval architect of the "Queen Mary," Britain's latest bid for sea-supremacy.

CALENDAR OF EXHIBITIONS AND EVENTS

- **July 6**—Opening, Summer School, Department of Architecture, Syracuse University, Syracuse, N. Y.
- **September 7-12**—Third World Power Congress, Washington, D. C.
- **September 25**—Opening, Courses in Art and Decoration, New York University, New York City.
- **October 9**—Annual meeting, North American Conference on Church Architecture, Cathedral of St. John the Divine, New York City.

OBITUARY

• Dead last month from discouragement was Edgar Chambless, 65-year old writer and sociologist. He for 25 years had sponsored the Roadtown idea of a linear city. Mr. Chambless had for years advocated "a program of laying down homes, villages and cities in straight lines like ribbons across what is now open country and cheap land, so that every one could live in close access to farm and gardens yet with all the advantages of urban life." Mr. Chambless proposed a factory every mile, thus avoiding industrial congestion with its disease, obsolescence, misery, and crime.

According to friends, Mr. Chambless' suicide was the result of disappointment over the failure of the 1939 World's Fair to entertain his theory that the Fair should be built around transportation rather than have the transportation extend for miles along the Fair grounds; that exhibits should be placed in relation to their function or use rather than for their architectural composition and, finally, that the Fair buildings should be prefabricated to eliminate the huge waste of material experienced in other fairs.

George McAneny, Chairman of the Board, World's Fair Corporation, was reported as "displaying more than usual interest in Mr. Chambless' scheme," but members of the recently appointed Architects' Advisory Board "could not remember the Chambless idea."

• William H. Weeks, well-known architect of San Francisco, California, is dead at the age of 72 after a lingering illness. Mr. Weeks, a native of Canada, came to this country as a youth. He had practiced in San Francisco for many years and was the designer of some 1,200 schoolhouses, besides many other buildings throughout the state. His son, Harold H. Weeks, with whom he was associated, will carry on the practice.

NEW PLAY PROTESTS MADE WORK FOR ARCHITECTS

Left to right: Marjorie Brown, Robert Brace, Jan Ullrich, Allen Nourse, Helen Morrow. The plight of the unemployed architect is dramatized in "Class of '29," current Federal Theater (WPA) production in New York. Ken Holden (center) goes on a drinking bout when he discovers his job in an architectural office was bought for him by a fond parent who didn't want his son demoralized. Says Holden, whose passion is prefabrication, "Too many lousy architects—so what? Give 'em relief work, that's what! Make lots of little houses, with lots of little yards with lots of little trees, so there'll be lots of little leaves to rake!"

MINIMAL, NOT MIRACLE

In "an effort to show that a skilled builder, with careful planning, can provide a really low-priced house with the essentials of living, measuring up to minimum standards and good for 30 to 40 years," the FHA has designed a home in the $1,300 price range. In making the announcement of this design, Miles L. Colean, Technical Director, emphasized these points:

1. This is not a "miracle house," with all the comforts of a mansion, but is a practical, livable, durable structure reduced to the necessities.
2. The home is primarily for small communities or for working men's suburban areas of large cities.
3. This is not an attempt to invade the field of the architect or of any organization providing plans for low-priced homes. The FHA will not issue any stock plans.

Conservation of materials, foundation, chimney, and wall construction; floors, interior finish, sheet metal, windows, painting, cabinets and closets, and hardware, heating, plumbing and drainage, water piping, sewage disposal, are among the subjects treated.

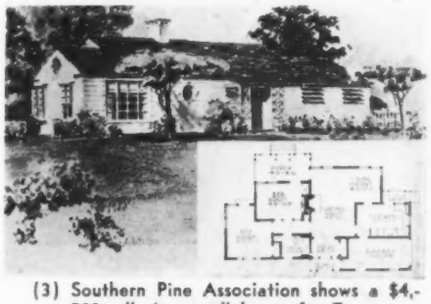
ANNOUNCES COMPETITION

House Beautiful has announced its Ninth Annual Small House Competition, open to all architects and architectural designers. The competition, which closes October 15, 1936, is limited to recently-constructed houses.

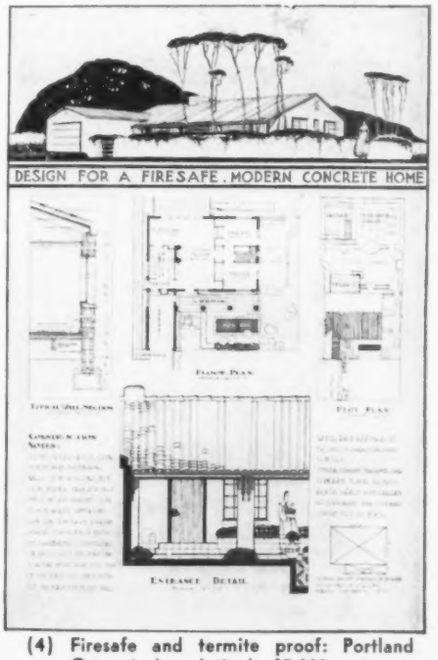
MODEL HOUSES AT 1936 FAIRS

(1) Cleveland Lumber Institute enters the $15,000 class.

(2) Brick Manufacturers' Association shows a $7,500 model in Cleveland.



(3) Southern Pine Association shows a $4,500, all-pine small house for Texas use.



(4) Firesafe and termite proof: Portland Cement Association's $5,000 entry at Dallas.

BROOKLYN BRIDGE

PHOTOGRAPH BY EWING GALLOWAY

HOUSING AND RECOVERY

by William Stanley Parker

In an article in the Harvard Bulletin of February 21, 1936, by Mr. W. E. Shepherd, he estimates the extent to which emergency expenditures of the Federal Government for housing have "created additional purchasing power." After citing the relevant statistics, he asks and answers, on page 633, this question: "To what extent, then, may we say that additional purchasing power has been created by the injection of such a sum into residential construction?"

In answering this question he analyzes the recent annual expenditure of $210,000,000, which he had deduced as being the expenditure for housing, first for direct labor and then for indirect labor. His totals add up apparently to the $210,000,000, with no indication of any recognition of the value of such expenditures as they turn over in the other subsequent pockets of the community.

The indirect workers referred to are the persons employed in shops or mills that produce the materials and equipment used on the work—the direct workers being those employed at the site. Why eliminate from such an estimate all appraisal of the purchasing power created by the expenditure of the funds after they pass from the hands of the "direct" and "indirect" workers into the hands of local shopkeepers and others?

It is quite clear that the bulk of the wages so paid is spent by these direct and indirect workers probably within two weeks, and surely within a month, under present conditions. They doubtless go first for the various cash and carry purchases of food, clothing, transportation or gasoline, movies and other day to day incidentals, and secondly for rent, coal, and light and, probably thirdly, in many cases to pay accumulated debts for some or all of such expenses during previous weeks or months, which third factor is merely a delayed series of first and second factors.

If this is so, the $210,000,000 of purchasing power given to direct and indirect workers in the construction industry provides almost immediate-

ly $210,000,000 of purchasing power scattered through the various retail trade and service groups of their various communities and to the owners of property receiving payments on account of rent.

Efforts to trace the further turnover of these funds become obviously more and more difficult but the fact that the turnover continues seems to be irrefutable. The shopkeeper is enabled to pay his assistants or even may be forced to take on again some employees that had been dropped on account of poor business. These employees immediately spend their wages, as the original workers did, for food, clothing, and shelter, and various services and entertainment, and the spiral continues with ever widening radius.

How many times a year does such an original dollar of expenditure turnover through the community? I have never found any one who admitted to a knowledge of the answer to this question, whether he were an ordinary business man or a professor of economics. No one, however, has denied the fact of repeated turnover. No one has stated, in answer to frequent queries, that it was foolish to place the turnover at twenty times a year. Men trained in the study of economics have said that to put the turnover at ten times a year would be conservative.

If there are attempts to determine, as Mr. Shepherd does in his paper, the "additional purchasing power" created by the expenditure of $210,000,000 annually during the past two years for housing construction, why should one not be able to say that the annual purchasing power so created was at least $2,100,000,000 and possibly twice as much as that if we only knew how to estimate it accurately.

If one were making estimates of the *comparative* value of spending $210,000,000 for housing instead of schoolhouses, this turnover factor could perfectly well be omitted as it would be equally effective in either case, although the resulting social benefits might differ. If such expenditures for housing were compared with similar expenditures for roads, the results might show a much broader initial spread through the community in the skilled trades rather than a concentration on common labor, equipment and materials, but after the first turnover the results might become very similar. In all such *comparative* studies the factor of turnover might be largely neglected, but when an attempt is made to determine the positive values of such an expenditure, how can this factor of turnover be omitted from our calculations?

Let us very briefly, for purposes of illustration, consider the direct economic value to Boston of the expenditures involved in the construction of the South Boston Housing project.

Boston must pay its share of the cost to the Federal Government of the National PWA housing program. The total cost is to be about $100,000,000, fifty-five per cent of which must be self-liquidating, the balance being allotted as grants. This $45,000,000 balance, then, will come out of taxes. Boston's share of this Federal tax appears to be about one per cent, on which basis its share of the PWA housing grants would be $450,000.

The cost of construction for the South Boston project has been announced as about $5,000,000. It is estimated that about 75% will be spent for labor at the site, labor and materials in local shops, and the various professional and other local services involved. Without attempting a detailed analysis of this estimate which, however, is believed to be reasonably accurate, it would mean an initial expenditure of $3,750,000 locally, and on the basis of a turnover factor of ten, it would mean a total purchasing power in a year of $37,500,000.

Boston's share of the whole program, at $450,000, would be 1.2% of this one year's purchasing power. This would seem to be a more intelligible and accurate appraisal of the economic value to Boston of this expenditure than merely to compare the $450,000 cost to the first expenditure of $3,750,000. But I do not remember having seen this approach to the problem taken in any published analyses of this broad question that have come to my attention.

CLEARANCE SOLIDS FOR RECREATION BUILDINGS

by GAVIN HADDEN, C.E.

The design of buildings for recreation—for games and sports indoors—is three-dimensional to an unusual degree. For any specific room or unit of such buildings it is not enough merely to apply to the plan a uniform reasonable ceiling height, as for many other indoor activities; almost every game or sport requires a particular headroom and the headroom required is not necessarily uniform over the entire floor area. Moreover, these different headroom requirements, providing as they do for the paths of balls and other implements of play sometimes traveling at great speed, providing also in many cases for the bodies of the participants while moving in unusual paths, may attain considerable heights above the floor. If the designer provides too little headroom the usefulness of the unit is destroyed; if he provides too much headroom, space is wasted with resulting losses in economy.

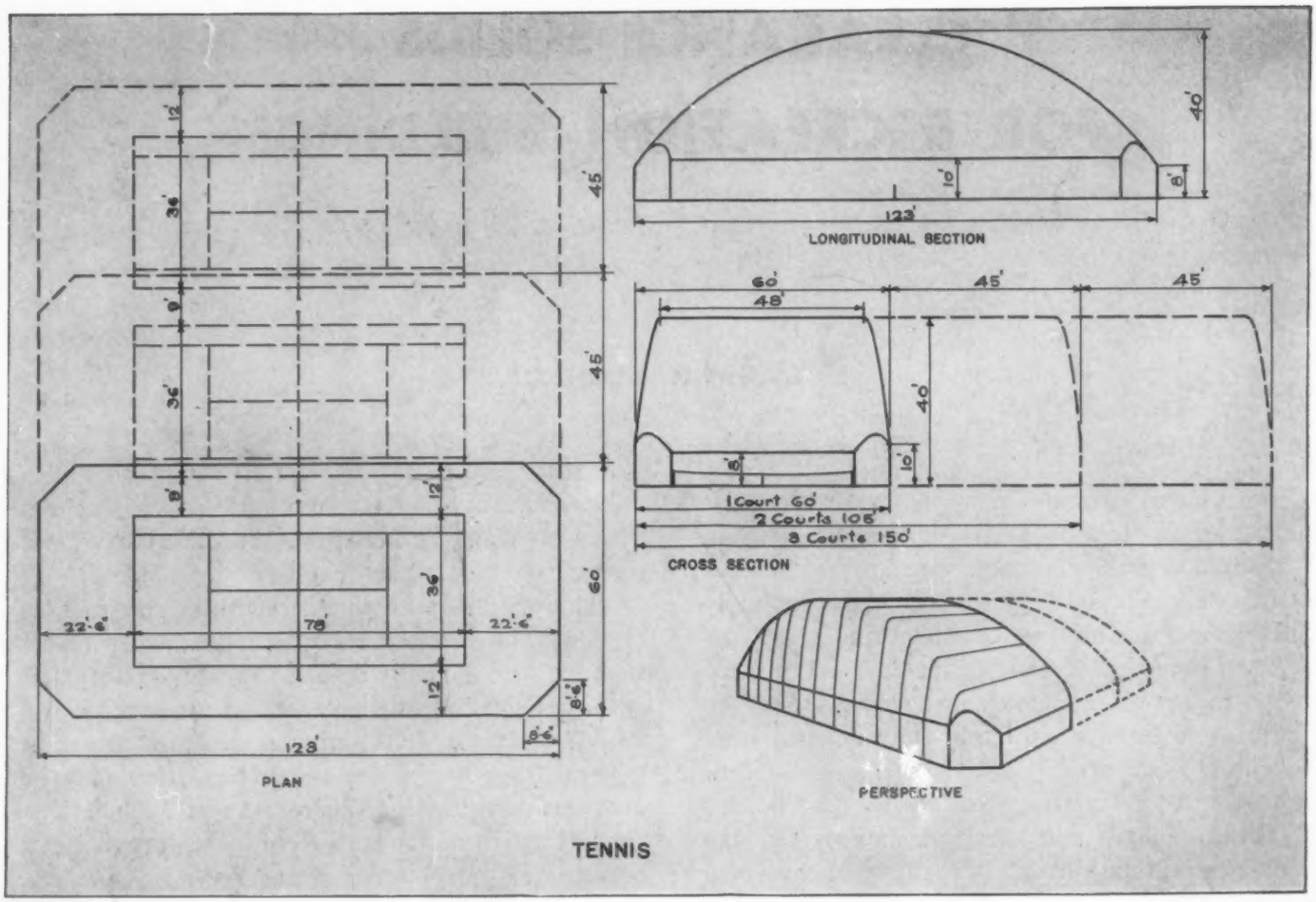
For most of the popular games, whether they are played indoors or outdoors, uniform or "standard" playing conditions are extremely important. Much has been done by widespread international competition, in the Olympic Games and in the Davis Cup tennis matches, for example, to fix throughout the world standard horizontal dimensions for the playing areas; on the other hand, except incompletely in a few cases, nothing has ever been done to fix standard vertical dimensions for the headroom over these areas. At the present time at any rate, the determination of the proper headroom in nearly every case must be a matter of experience and judgment.

For many games even the plan dimensions of the areas required are not fixed. In some cases those who know the requirements well have reached close agreement; in other cases, however, there is no unanimity of opinion whatever and the recommendations of the most experienced students and teachers of the game may be far apart. In these latter cases the task of the designer may be difficult indeed.

The drawings presented herewith are intended to represent, in plan, section or elevation, and perspective, the space actually required for satisfactory and safe participation in the various recreational activities designated. The activities represented are in general those for which special provision may be frequently required. Where standard dimensions for any activity have been fixed by rule, regulation, or recognized and accepted custom, such standard or accepted dimensions have been used; where no standards and no accepted customs exist, those dimensions have been used which study and experience during fifteen years of practice have dictated as being reasonable minima under normal conditions—where other conflicting conditions do not take precedence. This does not mean that designs should never be made with either smaller or larger clearance solids than those shown; on the contrary, the amount of space provided has frequently been more or less than that indicated, because of other conditions. The drawings must be regarded as guides only: they should be used only with the exercise of care and sound judgment.

A study of plans, sections and elevations will show clearly the relative total amounts of space required for the various activities. It should be noted, however, that the costs of construction of the various facilities cannot be compared directly on the basis of their cubage. Roof spans, surfacing materials, special equipment, and the like, have so great an influence on the cost that such comparisons are practically meaningless.

Whenever, as in the case of most of the "open"



Cubic spaces required for sport activities may have and have had a definite influence on the structural design of buildings required to house them. This diagram indicates not only the plan dimensions for indoor tennis but also required cubical areas.

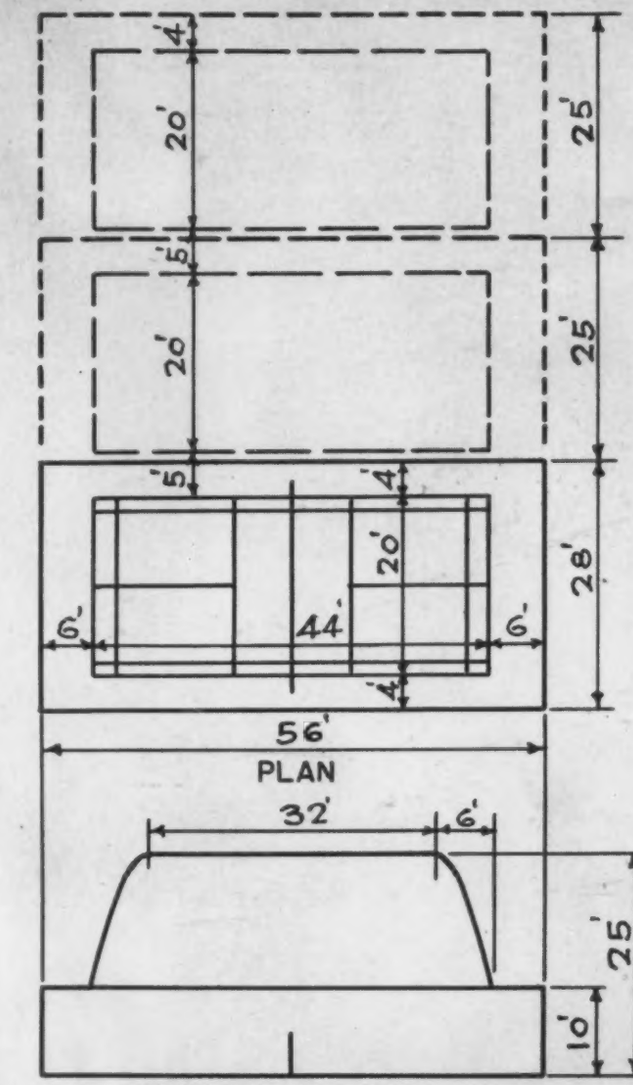
court games (tennis, badminton, paddle tennis, basketball, etc.), a repetition of units without obstruction on the floor between them will conserve space, such repetitions are indicated by broken lines in the drawings. Repetitions can be continued indefinitely.

TENNIS

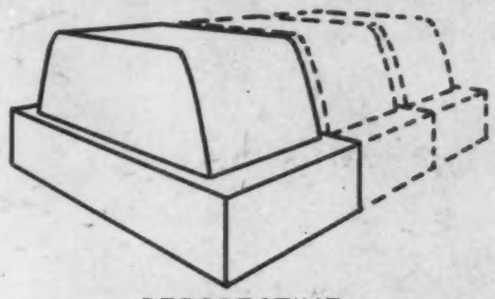
It is interesting to note how the shapes of the clearance solids may have and have had a definite influence on the structural design of buildings required to house them. The readers of this article may be familiar with the writer's "trajectory" types of buildings for tennis courts, with their unorthodox roof forms—the direct result of the required clearance solid.

BADMINTON

Another striking example may be found in badminton court buildings. The clearance solids for two or more badminton courts show, midway between adjacent courts, a narrow rectangular space, not required for play, extending upward from ten feet above the floor. This space indicates a perfect location for trusses supporting the roof, and this space has been so used in multiple court buildings.

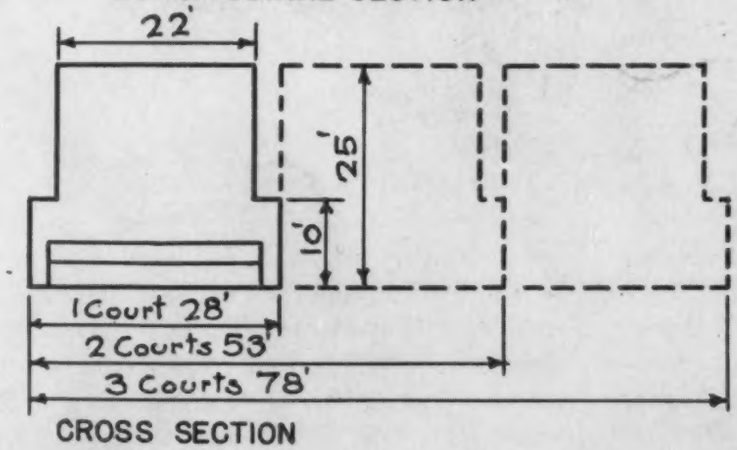


PLAN



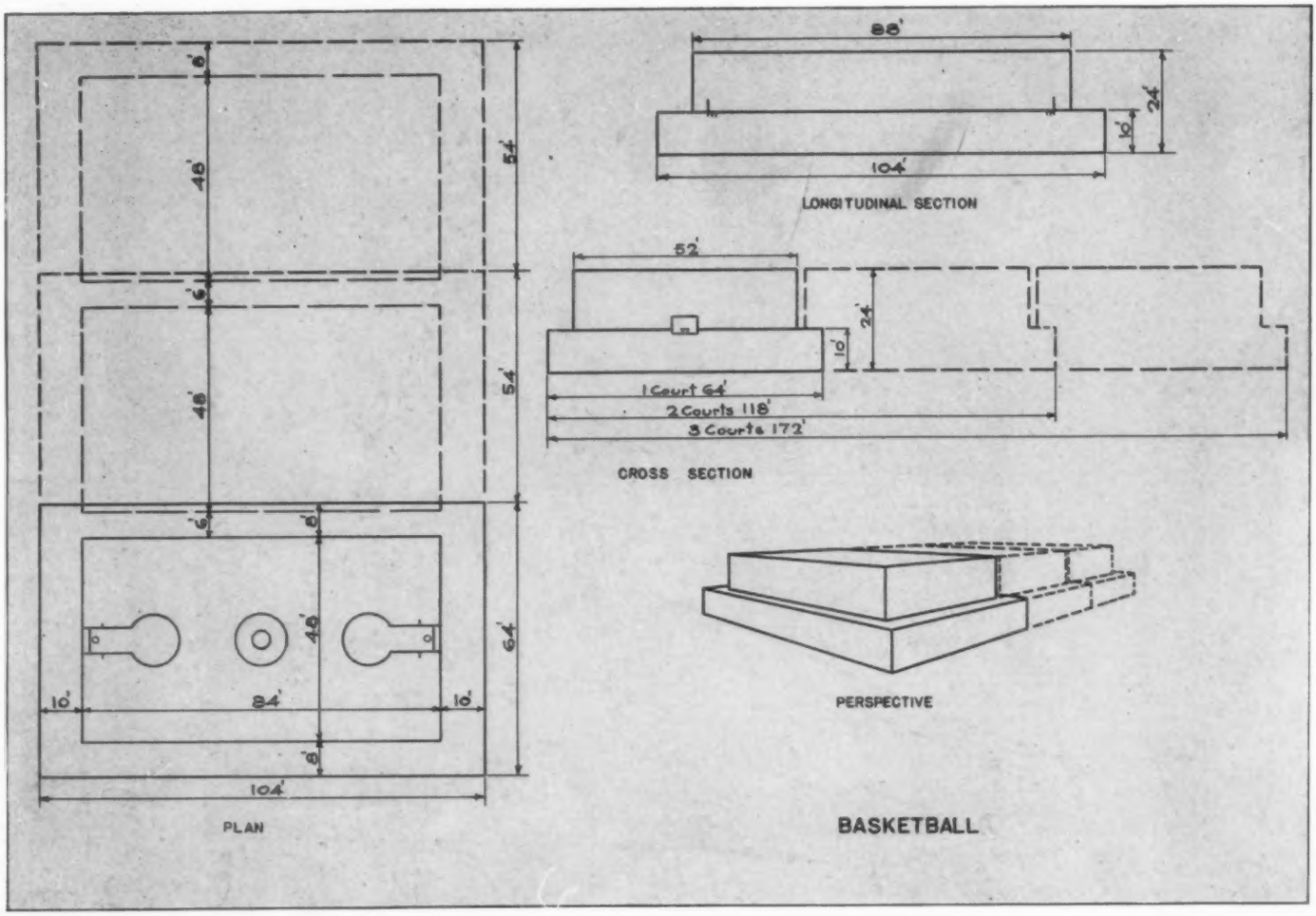
PERSPECTIVE

LONGITUDINAL SECTION



CROSS SECTION

BADMINTON



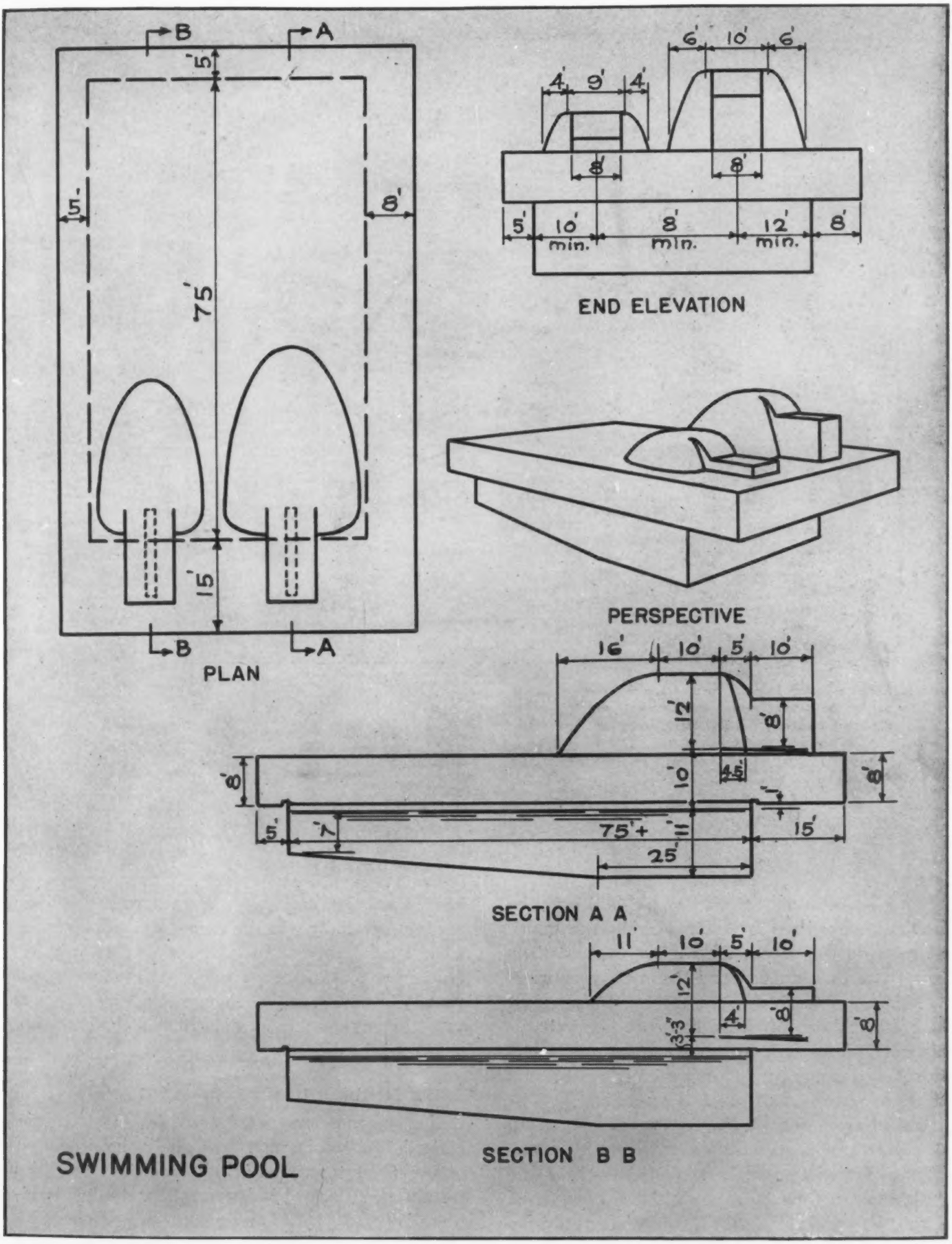
Clearance solids for basketball are more horizontal than for the tennis court building. "The horizontal dimensions shown for the basketball courts are not standard, but are those recommended by the Joint Basketball Rules Committee for men of college age; for schoolboys and for women, different dimensions are recommended."

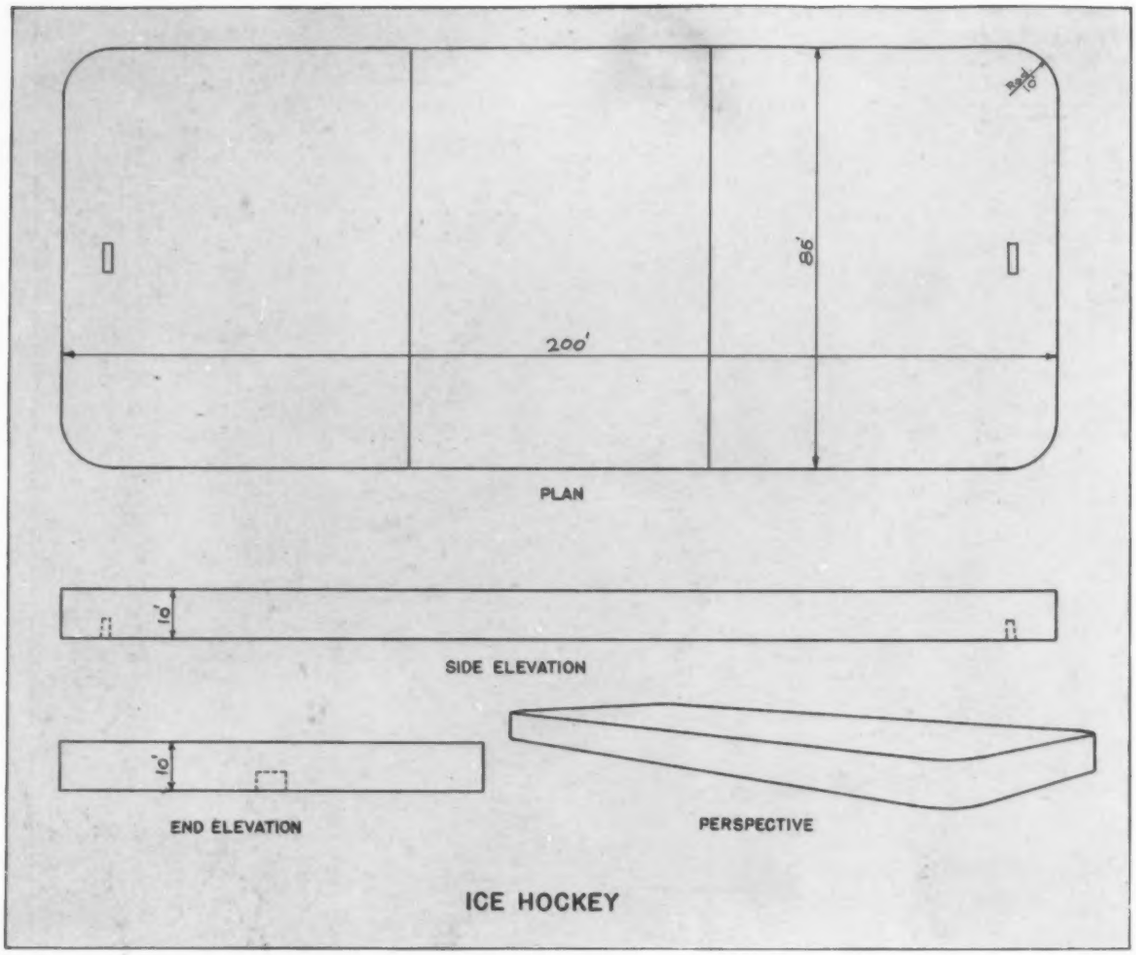
BASKETBALL

Similar locations for roof trusses, or for trusses supporting upper floors, are indicated in the clearance solids for basketball. The horizontal dimensions shown for the basketball courts are not standard, but are those recommended by the Joint Basketball Rules Committee for men of college age; for schoolboys and for women, different dimensions are recommended.

SWIMMING

The clearance solid of the typical swimming pool room, with its provision for high and low springboard diving, shows clearly and positively what space may be used for galleries or balconies, or for upper stories of a building. It should be noted that for the presentation of this solid an exceptionally wide pool is indicated, in order to permit the separation of the spaces required for the two dives and thus to show them without confusion. In the usual case, the two springboards would be placed closer together (but not less than, say, 8′ center to center) and their spaces would overlap.


B
A
5'
5'
8'
75'
15'
B
A
PLAN
6'
10'
6'
4'
9'
4'
8'
8'
5'
10' min.
8' min.
12' min.
8'
END ELEVATION
PERSPECTIVE
16'
10'
5'
10'
12'
8'
8'
10'
4.5'
8'
5'
7'
75'+
11'
15'
25'
SECTION A A
11'
10'
5'
10'
12'
4'
8'
3'-3"
8'
SECTION B B
SWIMMING POOL



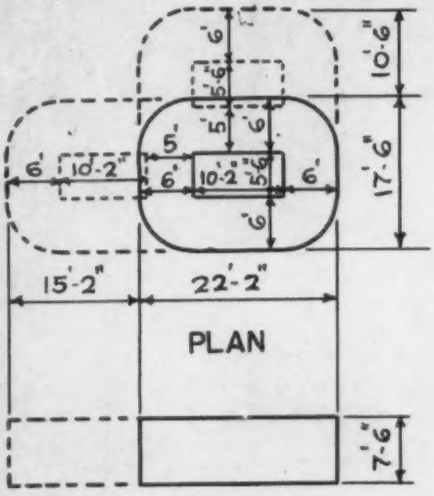
Clearance solid for hockey indicates space reasonably required for playing the game. Ten feet headroom over any part of the playing area may be considered as actually necessary.

HOCKEY

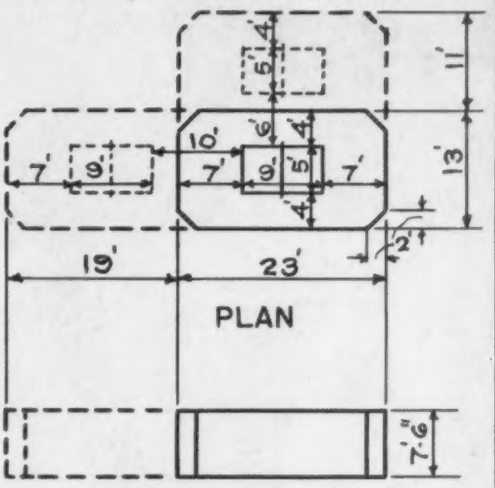
The clearance solid for hockey includes only the space reasonably required for playing the game. The rules do not permit the players to raise their sticks above the shoulder, and the puck rarely rises more than a few feet above the ice during play. Therefore, although it is perhaps not likely that a rink will ever be built without more than 10 feet headroom over any part of it, a greater height than this is not actually necessary. For practice, as distinguished from formal games, even less than 10 feet headroom will serve satisfactorily, at least over portions of the ice; reliable opinions have held that a headroom of only 8′-6″, over the side areas of the rink for example, would serve satisfactorily for hockey practice, and this lower headroom has been used to advantage in designing for spectators in some special cases. In addition to the space required for play, some outside space is required for penalty benches, etc., but this space need not be provided at any specific location and is therefore not shown in the diagram.

TABLE TENNIS, BILLIARDS, BOWLING

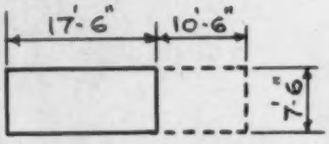
For the more restricted activities—table tennis, billiards (or pool), and bowling—a headroom of only 7′-6″ is shown. Facilities for these activities may often be located in basements, and a low headroom is in no way a handicap for any of them.



SIDE ELEVATION



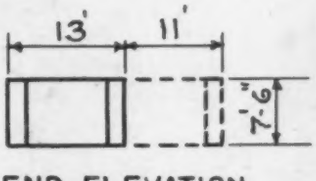
SIDE ELEVATION



END ELEVATION

PERSPECTIVE

BILLIARDS



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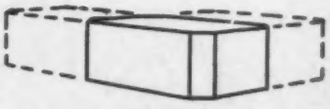
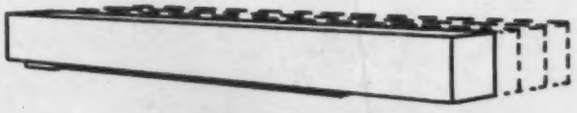


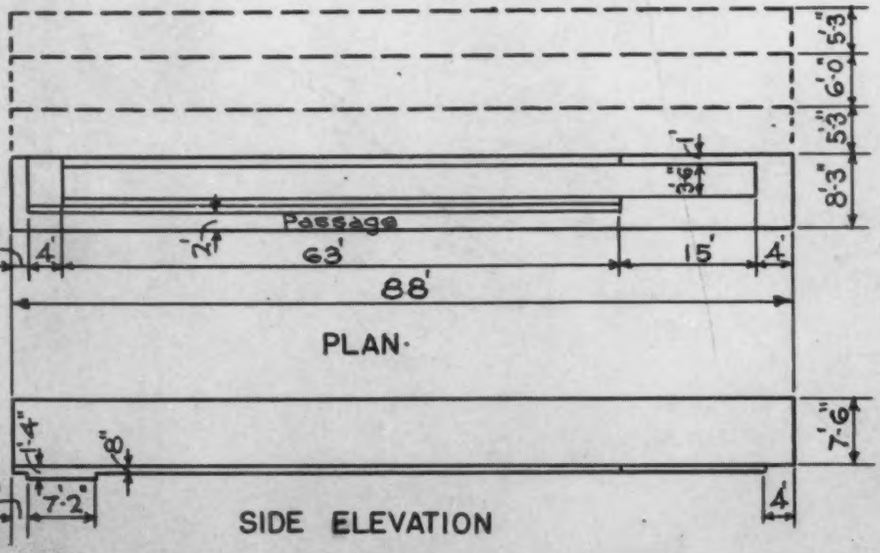
PERSPECTIVE

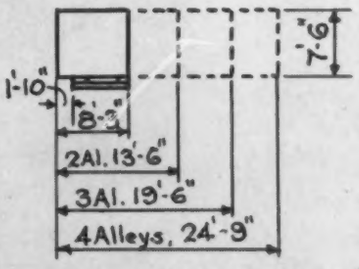
TABLE TENNIS



PERSPECTIVE

BOWLING





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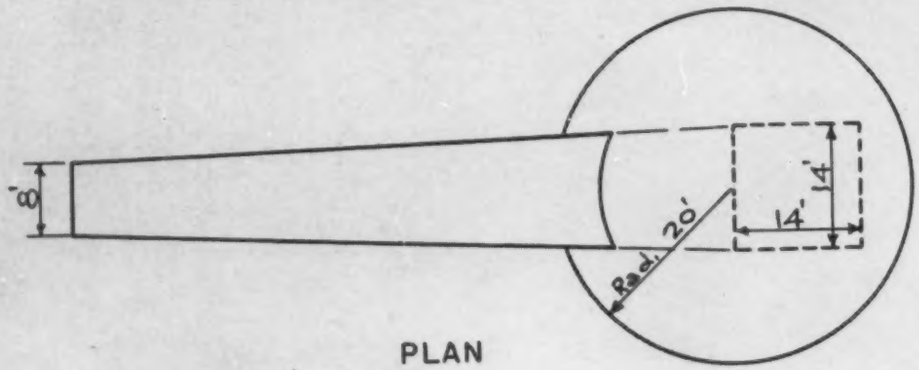
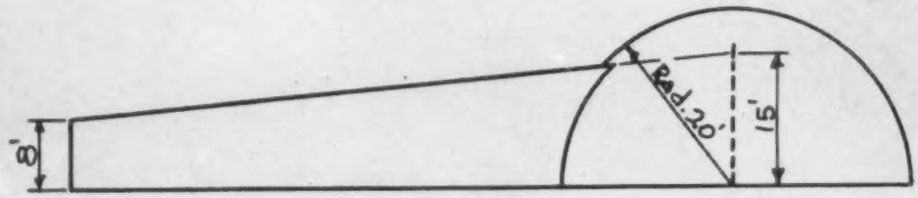
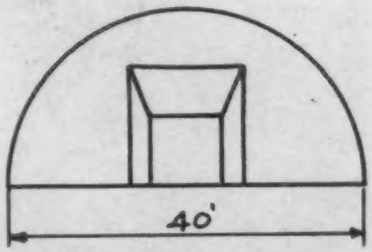


PLAN



SIDE ELEVATION



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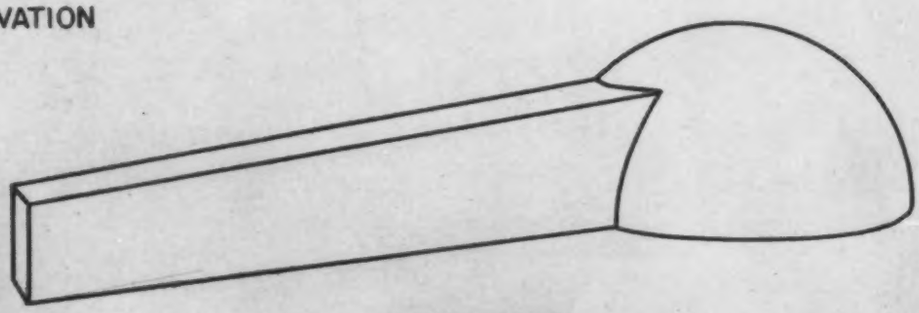
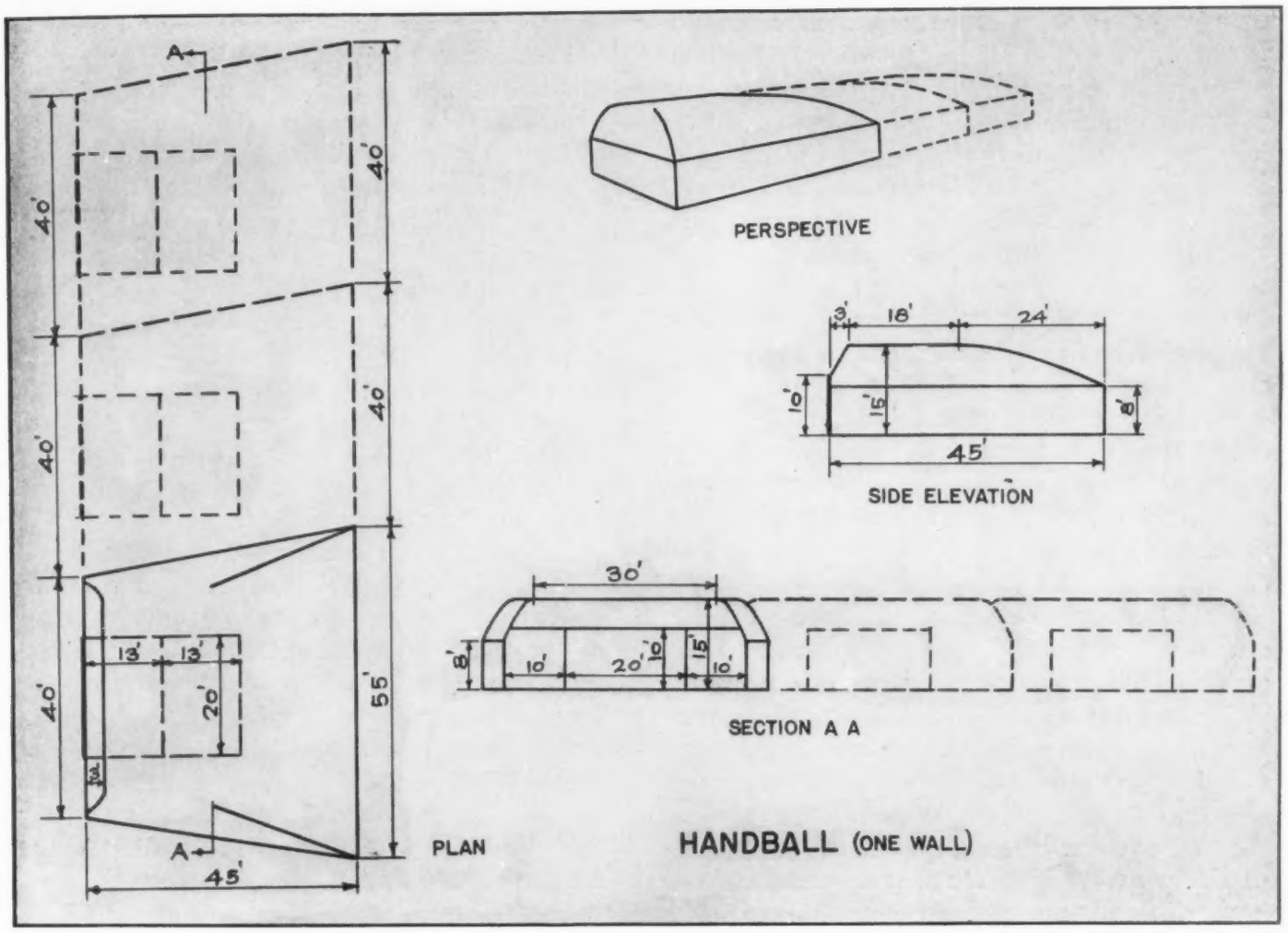


PERSPECTIVE

POLE VAULT



POLE VAULT

The clearance solid for pole vaulting, or rather an earlier similar solid, was used by the writer in determining the location of the cross-bracing for a tall structure under which it was planned to practice this activity. It was intended to place the cross-bracing high enough to permit performers to vault in safety to the greatest possible height, but since the structure was built the world's record for the pole vault has risen from 13′-3 9/16″ (1919) to 14′-4 3/8″ (1932) so that the space provided is somewhat less useful than was intended. The solid here shown would provide sufficient space for vaults of 15′-0″ and perhaps somewhat higher.

This, incidentally, brings up some factors which must be recognized and given due consideration by the designer. He should in some cases consider not only the possibilities of increasing skill on the part of the participants, but also the possibilities of changes in the games themselves and their rules of play. He should also give due regard to the conditions which may affect the validity of *records*. Records are extremely important to the average athletic performer. If at any time he is turning in an exceptionally good performance, it is vital to him that the conditions affecting his performance shall not violate any of the rules governing the recognition and acceptance of his record. For example, the length of the swimming pool shown is 75 feet, so called, the most common length for swimming races indoors. There is a recognized set of official records for races of different lengths and different swimming strokes, all performed in

the so-called 75′-0″ pool. The pool may measure somewhat *over* 75′-0″ in length without objection, but if it measures the least bit *under* 75′-0″ no record in that pool can be officially accepted. Therefore it is usually important to specify that the pool shall have a finished inside length of, say, 75′-0½″.

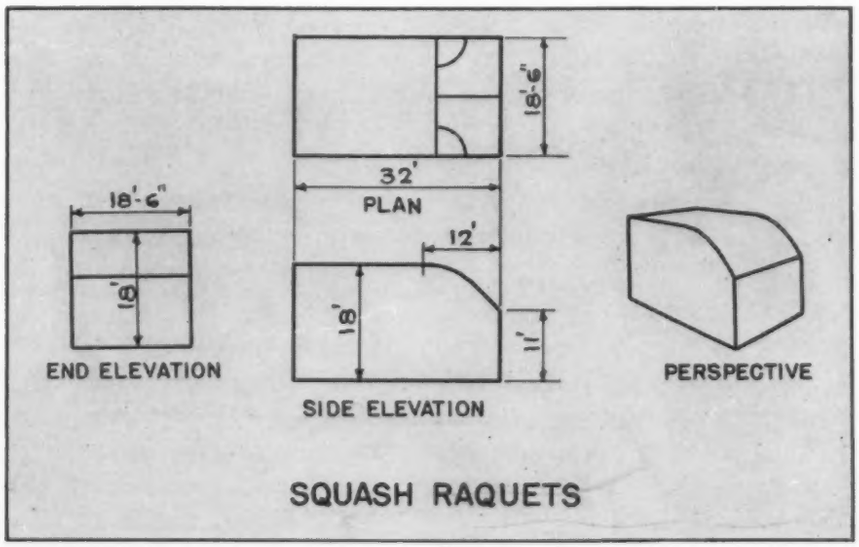
Another consideration which may influence the use of the clearance solids and modifications of them is allowance for mental hazard. As St. Paul has admonished against the "appearance of evil" so the designer must be admonished against the appearance of danger. In some cases if only just enough space is provided for a given activity the performer or player will not realize that there is enough and the mental hazard will prevent him from making a good performance. This consideration applies particularly to activities such as pole vaulting and diving.

If, as frequently happens, a unit is desired which can be used alternately for two or more different activities, then it is a simple matter to combine the clearance solids for those activities and thus determine a unit which will serve each one satisfactorily.

Where provision must be made for spectators, the clearance solids attain increased usefulness, as they show just what space outside of them can be used for spectators and for their seats and supporting structures. Sometimes it is possible to use for spectators some of the space inside the clearance solid, as for example some of the space near the net line in the tennis court solid; in the usual case, however, in designing for spectators it is necessary to add additional spaces to the solids, not only to accommodate the spectators and their seats, but also to provide for unobstructed sight lines. It may be of interest to note here that in considering various means of economizing in the addition of such spaces, a scheme has been developed (for which patent has been applied for) whereby the spectators at certain events are furnished with a reflected view by the installation of mirrors at suitable points on or near the surfaces of the clearance solids. For activities requiring a view from above, steeply approaching the vertical, as in the case of swimming races or squash games, such a reflected view has great advantages to compensate for its indirect and reversed character.

Still another possibility is to provide a vertical view for spectators while they are lying in recumbent, or semi-recumbent, attitudes, with their eyes close to the curved surfaces of some of the solids. For example, it might be possible to provide in this way for a considerable number of spectators at a squash court, covering with spectators' heads the curved clearance surface above the back part of the court. Such spectators could be made comfortable reclining on cushions, with suitable supports for their heads.

These considerations form another story, outside the scope of this article, but they indicate that all the possibilities of use of these clearance solids have not yet been explored.



SQUASH RAQUETS

VIEW ALONG BROADWAY, IN THE BUSINESS DISTRICT

LONGVIEW, WASHINGTON

By S. HERBERT HARE

The city of Longview, Washington, was founded by the Long-Bell Lumber Company, of Kansas City, Missouri, as a center for extensive lumber and mill operations on the North Pacific Coast. It is one of the few cities which have been completely planned in advance of development. The area included, as shown in the accompanying general plan, was 14,000 acres, having seven miles of deep water frontage on the Columbia River and five miles of shallow water on the Cowlitz River. The city was to be in no sense a "Company" or mill town, but a general industrial and seaport city, attractive to various industrial groups. It was also the particular wish of the late R. A. Long, Chairman of the Board of the Company, that the city be attractive as a place of living for working people, with proper recreational and educational facilities and suitable protection for those making investments in homes.

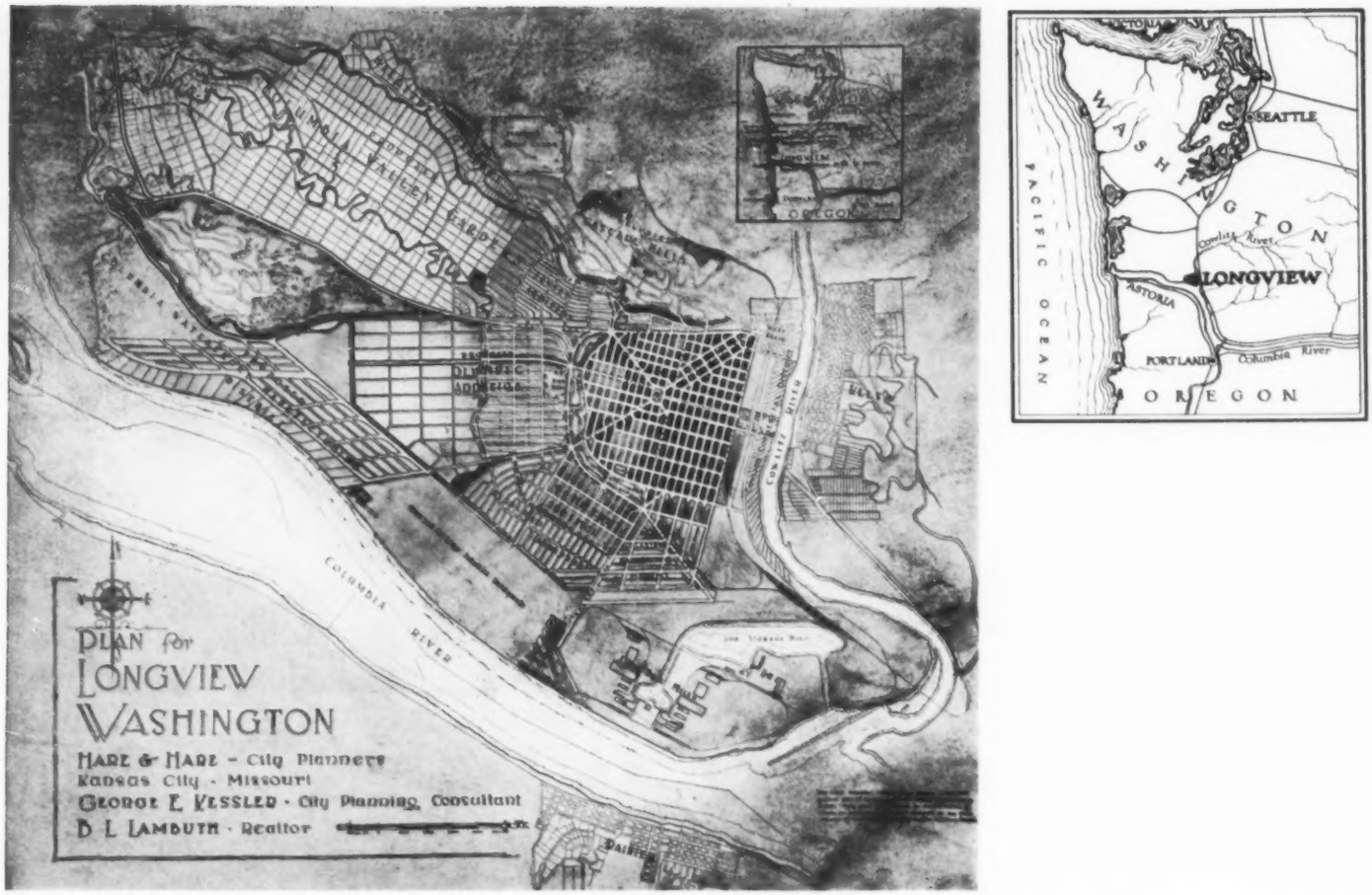
THE SITE

The location on the Columbia River at the mouth of the Cowlitz was particularly strategic, with ocean shipping and adequate fresh water harbor facilities at the first point of contact with the transcontinental and coastwise rail lines. In addition to the lumber activities in the district, there are extensive areas of rich agricultural land in the many flat valleys.

The town site is a fertile valley of triangular form, bounded by the Columbia and Cowlitz Rivers on the southwest and east respectively, and on the north by hills rising to an elevation of about four hundred feet within the limits of the site. Mt. Solo, an abrupt hill nearly six hundred feet high, rises in the westerly end of the valley.

THE PLAN

After consolidation of land holdings and collection of statistical information regarding several smaller industrial cities, the planning of Longview was started in June 1922. The firm of Hare & Hare, of Kansas City, Missouri, was chosen as city planners. The late George E. Kessler, of St. Louis,



GENERAL PLAN OF THE FOURTEEN-THOUSAND-ACRE TOWN SITE, SHOWING RELATION TO COLUMBIA AND COWLITZ RIVERS

served as planning consultant until his death early in 1923. Mr. B. L. Lambuth, of Seattle, was assigned to head the real estate operations, and collaborated in the planning from that point of view. Mr. J. C. Nichols, developer of the Country Club residential district in Kansas City, Missouri, rendered services as a real estate consultant in site selection and development. Engineering services were furnished by the company's staff headed by Mr. Wesley Vandercook.

The street plan is a system of major thoroughfares for through traffic, and secondary streets serving local needs. The major thoroughfares are both circumferential and radial, including main lines of traffic to the retail center, with by-pass routes around, so that traffic is not forced through this center. Connections to the various bridges, the port, and the highway toward the ocean on the west are provided. These thoroughfares are from one hundred to one hundred and twenty feet wide. The minor streets are mostly arranged in a fairly uniform rectangular pattern on the flat portions of the site, and are adjusted to the topography in the broken areas. This rectangular pattern, however, is adjusted at the point of meeting with the main diagonal thoroughfares so as to avoid unnecessary acute angle intersections. The local streets range from fifty to sixty feet in the residential districts to eighty feet in the business district. Paving widths vary from twenty-four feet on minor streets to sixty feet on major thoroughfares.

Twenty-foot alleys were provided in the business district and in most of the residential districts. This latter provision was based on certain local customs as to delivery and storage of slab wood for fuel.

A systematic planting of street trees was made on residential streets and, in a few cases, on main business thoroughfares.

VIEW FROM SOUTHEAST showing Lake Sacajawea Parkway at left with smaller house district in lower left corner, Robert A. Long High School in distance at left, and churches, grade school, hospital and Y. M. C. A. building bordering right side of lake; Jefferson Square in distance at right, and better residential district in distance.

After considerable discussion, a standard lot size of fifty by one hundred and twenty feet was adopted, this size being considered most adaptable to conversion of use in the future. Larger suburban tracts were based on multiples of this size, so as to be subject to redivision.

PUBLIC PROPERTIES

Park areas were provided as a part of the complete plan. A six-acre tract at the center, called Jefferson Square, was established as a setting for public and semi-public buildings. The Longview Public Library, Monticello Hotel, and Post Office have been built adjacent to this park. Other small parks, providing neighborhood recreational facilities, were set aside at intervals. The outstanding park feature of the city is the Lake Sacajawea Parkway, with its adjacent boulevards. In this area of one hundred acres, one and one-half miles in length, an old slough, at one time the bed of the Cowlitz River, was transformed into a continuous chain of picturesque lakes by pumping about 2,000,000 yards of earth for filling in the inner sections of the city. The planning of this chain of lakes, to produce a naturalistic effect both in the lake forms and in the grading of the adjacent land, was an interesting problem in landscape design. The land area about the lakes provides recreation space, while the water area is suitable for boating and canoeing. The landscape development of this area was a gift to the city by Mr. Long.

Land for some lesser parkways was reserved along the main drainage ditches, and the greater portion of Mt. Solo will probably become a large park in the future. Certain of the steeper slopes facing the city on the north, and unsuitable for residential use, will be assigned to park use to protect their natural scenery.

VIEW FROM MONTICELLO HOTEL ACROSS JEFFERSON SQUARE TOWARD BUSINESS DISTRICT (AFTER).

School sites were reserved in the city plan. The Robert A. Long High School which, together with the Public Library, was a gift of Mr. Long, occupies about thirty acres of land at a central location. Three grade schools have been built, with sites of five acres or more each. Twenty-six hundred pupils attend these public schools.

A golf club, with a picturesque nine hole course, has been located in the north hills, and a modern cemetery has been established on a site at the westerly end of Mt. Solo, with a fine view over the Columbia River.

VIEW FROM MONTICELLO HOTEL (BEFORE).

PRIVATE PROPERTY

A zoning map was prepared as a part of the city plan, even though there was at that time no municipality to enact a zoning ordinance, and no enabling act in the state of Washington authorizing the zoning of smaller cities. The allocation of the uses of property indicated on that zoning map, together with control of private property applicable to various portions of the city, were incorporated into complete sets of restrictions. Most of these restrictions were filed with the various land plats, but a few were included in the deeds. These restrictions are of a self-perpetuating type—that is, they

WEST SIDE RESIDENTIAL DISTRICT ACROSS LAKE SACAJAWEA.

are automatically renewed at intervals unless certain steps are taken to discontinue them. Areas are set aside for detached single-family houses, for apartments, for local stores and a central retail district, and for light and heavy industry.

It was of course necessary to start a center of development for each class of use, with reserve space for expansion adjacent to each center. The greatest problem was to determine an economic balance between the cost of premature conversion of uses in the growth of the city, and the carrying charges of reserve land around the various centers of development. The plan, as developed, provides for a population of approximately fifty thousand people without conversion of use.

POPULATION

Only a portion of the entire planned town site has been incorporated, the balance being reserved as suburban area. In the fourteen years since the planning started, the population has reached approximately thirteen thousand, ten thousand of which are in the incorporated section. Approximately twenty thousand people, however, have been added to the district as a result of the Longview development, the adjacent communities across the

LAKE SACAJAWEA PARKWAY.

LIBRARY, FROM JEFFERSON SQUARE

Cowlitz and Columbia Rivers having benefited to some extent. The suburban tracts of one to five acres are popular as home sites with the workers in the mills, and the Federal Government has recently developed a subsistence homestead project of one hundred and forty acres in this area.

Besides the mills of the Long-Bell Lumber Company, unequalled in size in the world, and the large mills of the Weyerhaeuser Timber Company, there are thirty-four other industrial plants, including pulp mills, grain elevator, canning plant, marine oil plants, plywood factory, brass foundry and other plants employing nearly four thousand men, with an annual pay roll of approximately four and one-half million dollars. Both the number of men employed and the annual pay roll have increased materially since 1931. The city is now thirteenth in population in the state of Washington, but twelfth in retail sales. There are one hundred and ninety-two stores, occupying seventy-two business buildings.

The economic depression has probably been as acute in the lumber industry as in any other field. The city of Longview has suffered along with other communities on the north Pacific Coast, most of which depend largely upon lumber for their business activities. At the present time business is reviving, mills are operating, and there is less than three per cent vacancy in houses, with a small vacancy in business buildings. With the coordinated plan for the physical development of the city, an expansion in population and business development can follow along logical lines under proper control. The gaps between various centers of development previously started can be filled in, and the whole city should gradually become what the original plan contemplated—a complete civic unit, with proper provision for living and working attractive to the highest type of industrial workers and their families.

PORTFOLIO

Photograph by Spreng SWB, Basel

PORCH, LINDNER HOUSE, BASEL, SWITZERLAND F. BRAUNING, H. LEW AND A. DURIG, ARCHITECTS

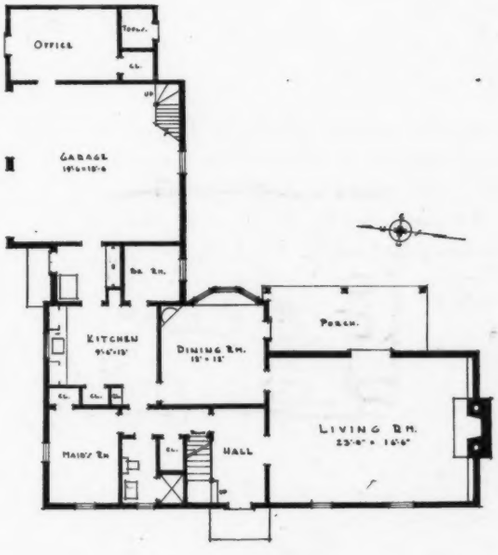
CURRENT ARCHITECTURE

Photographs by Murray M. Peters

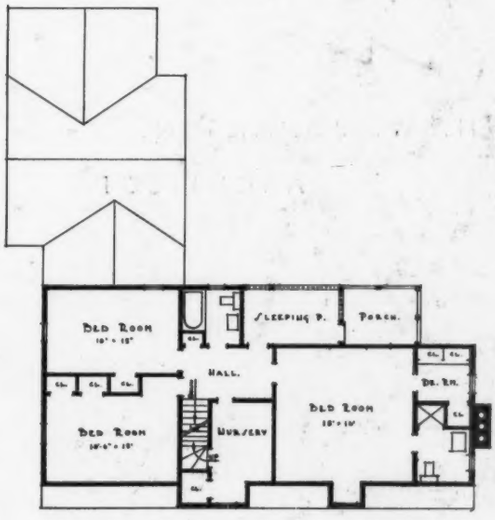
HOUSE FOR WALTER UHL

PORT WASHINGTON, N. Y.

H. W. JOHANSON, ARCHITECT



FIRST FLOOR PLAN



SECOND FLOOR PLAN

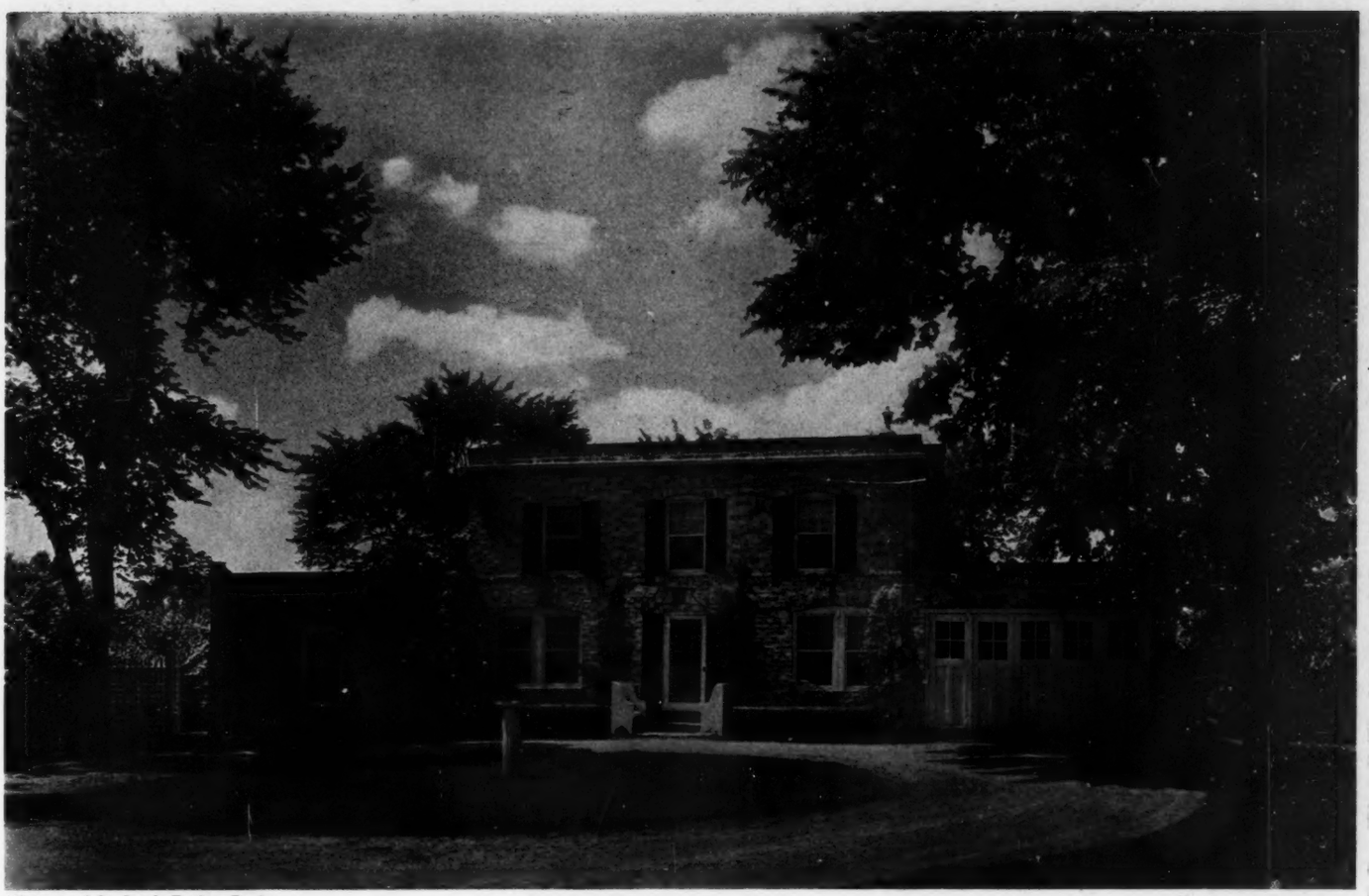
Photograph by Murray M. Peters

HOUSE FOR WALTER UHL

PORT WASHINGTON, N. Y.

H. W. JOHANSON,
ARCHITECT

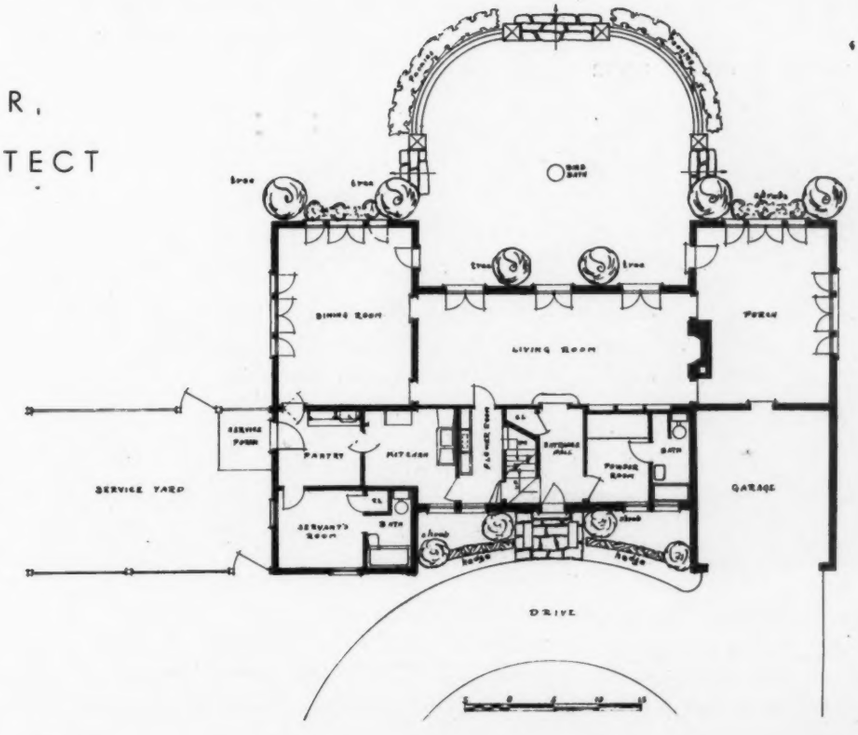
The house exterior is of brick veneer and hand-split shingles. There is a wide use of knotty pine woodwork in the interior and in the basement, where there is a game room (under the living room) and a bar (under the dining room). The cost was $13,750, including landscaping.



Photograph by Jessie Tarbox Beals

HOUSE FOR MRS. CHARLES FULLER — WINNETKA, ILLINOIS

R. F. FULLER,
ARCHITECT



The back of the lot overlooks the Indian Hill Golf Course; consequently, the main rooms of the house are arranged across the back to take advantage of the view.

HOUSE FOR MRS. C. FULLER
WINNETKA, ILLINOIS

R. F. FULLER,
ARCHITECT

Photograph by Jessie Tarbox Beals

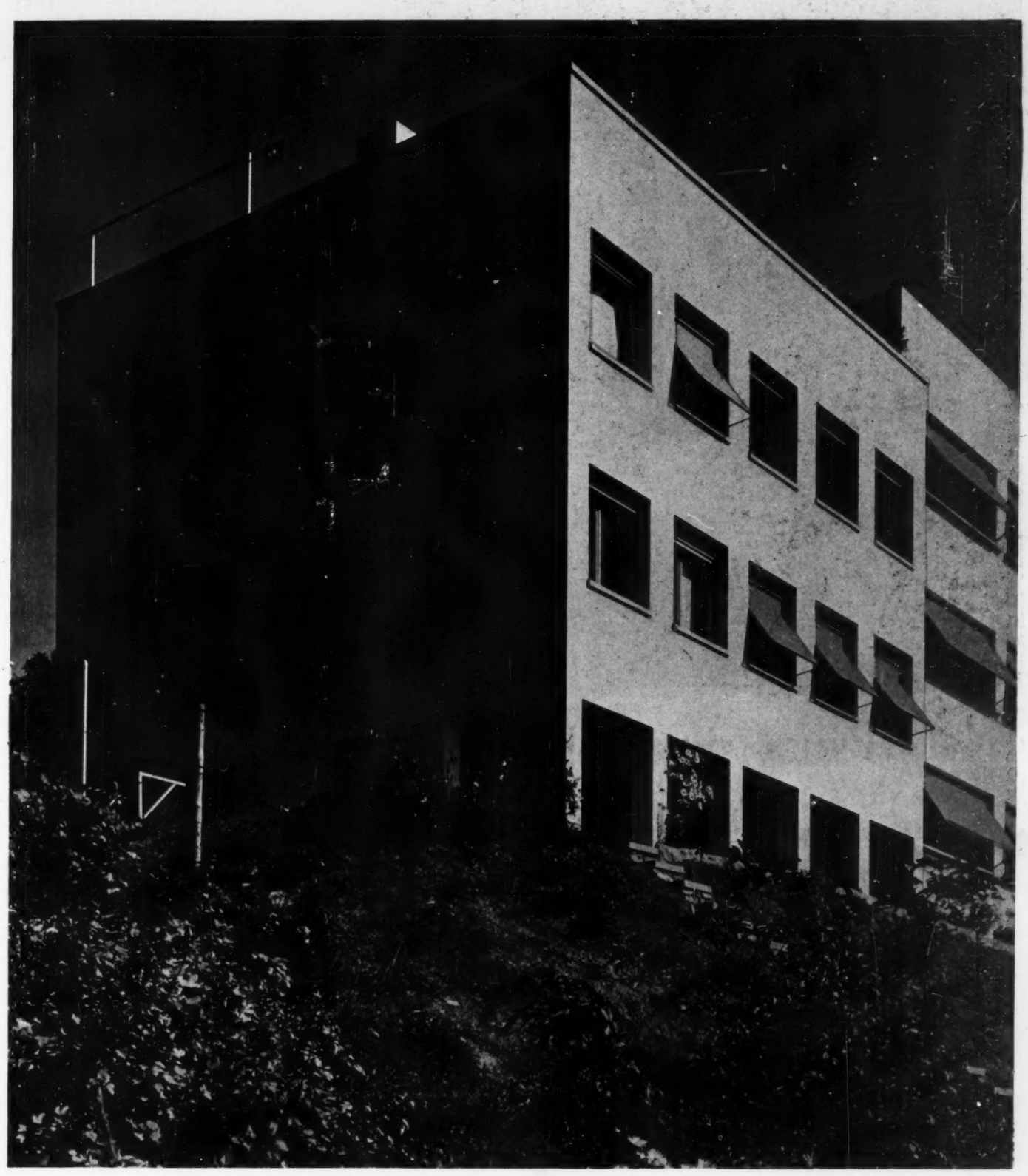
DETAIL OF ENTRANCE DOOR

Exterior, common brick painted white; sash and frames white; blinds, bottle green. Entrance hall and living room, canvas with applied molding, café-au-lait; dining room, white dado, white woodwork, wallpaper, vertical stripes and medallions on oyster white ground; powder room, green with built-in French provincial bed; bedrooms in various colors, walls and woodwork being painted to match.

SECOND FLOOR PLAN

HOUSE IN ZURICH, SWITZERLAND

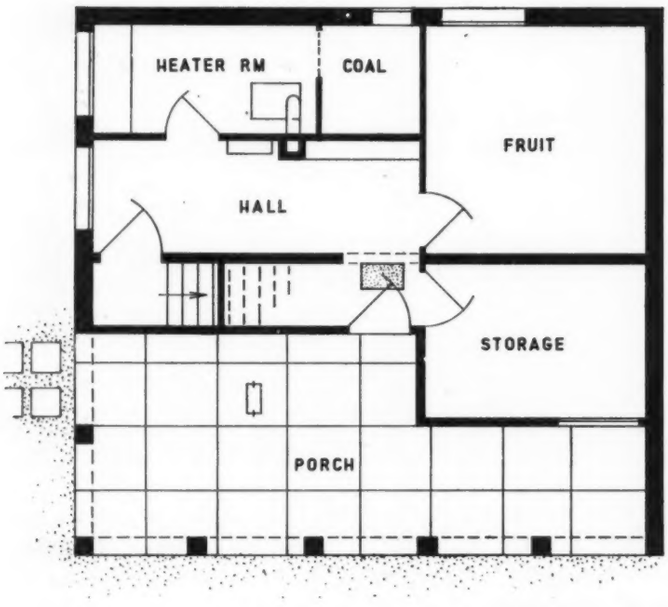
DESIGNED BY ALBERT FREY



VIEW FROM SOUTHWEST. This view shows the compact form of the house. A near cubicle volume gives the greatest amount of inclosed space with a given area of walls and floors. The broadside of the house which faces south and the view is a receiver of light by a maximum number of windows allowable with the employed masonry construction. The roll-up top shutters are shown projecting out, providing shade and maintaining circulation of air and vision. All openings are standardized. This made possible most economical manufacturing of sills and lintels, windows, shutters and shades.

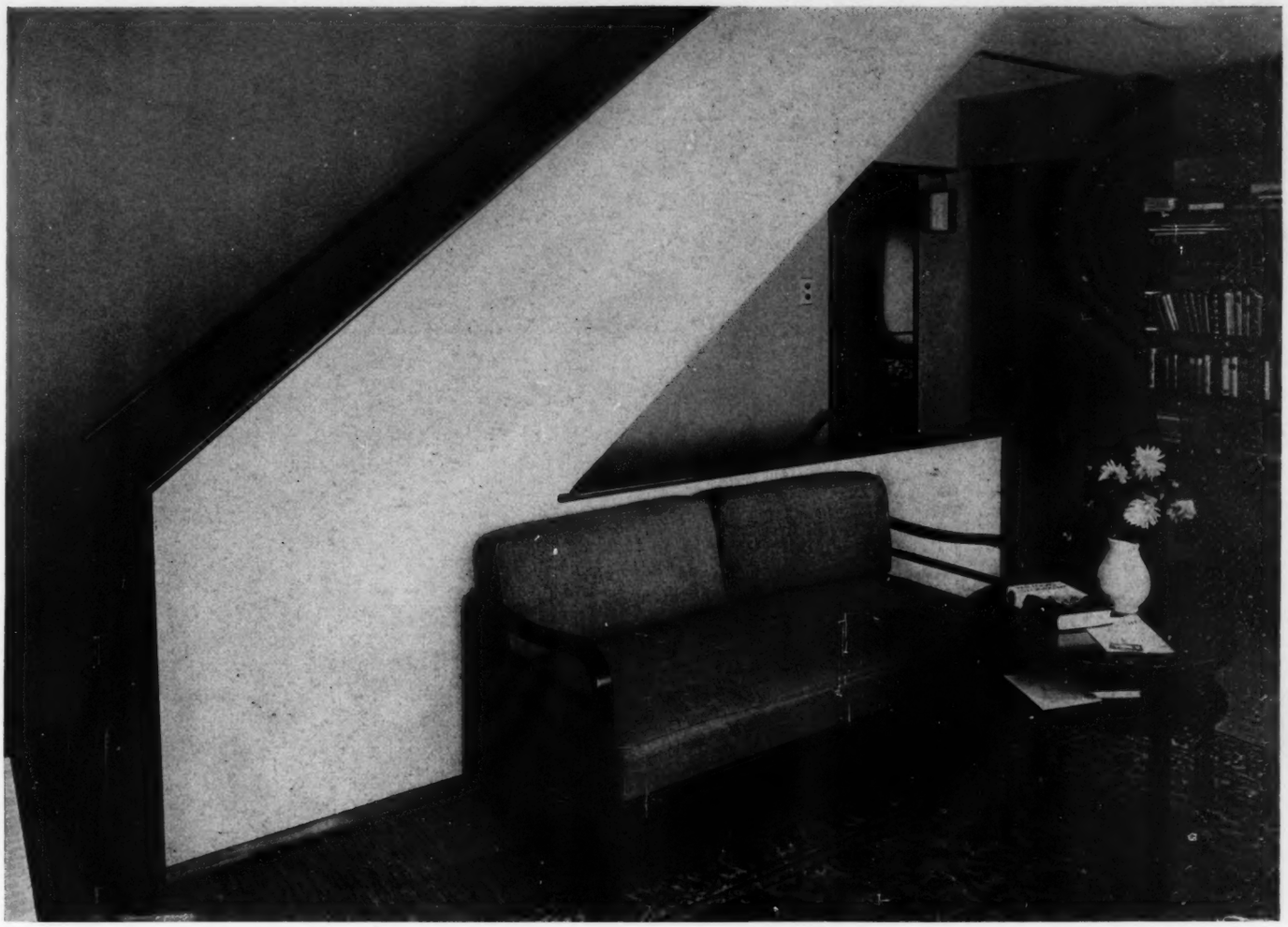
Photographs by Finsler

HOUSE IN ZURICH, SWITZERLAND



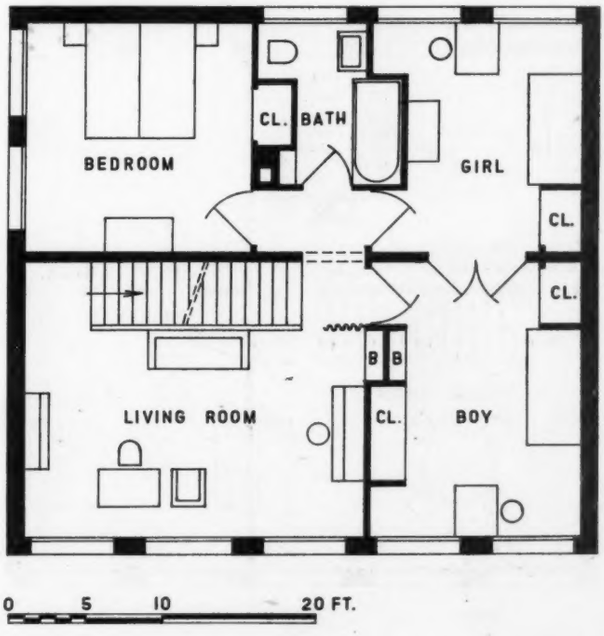
THE ENTRANCE PORCH (above) which provides a well-sheltered entrance to the house, is also a pleasant outdoor sitting and playing space. Before entering the house one enjoys the sweeping view of the city below. The steelpipe framework in the foreground is used in cleaning carpets and rugs.

GROUND FLOOR PLAN. The house is entered by a sheltered porch which faces the view and south. Due to the steep slope of the terrain the porch floor is above ground, while fruit cellar and heater room are below it making that half of the house area a basement. Since there is no attic in the house, being flat roofed, storage space for trunks, garden furniture, bicycle and baby carriage is provided on this floor, conveniently located for easy access from the outside. A work bench is placed under the window of the heater room. The boiler is for a hot-water heating system. A swing for the children is suspended from the ceiling of the open-air porch.



DESIGNED BY ALBERT FREY

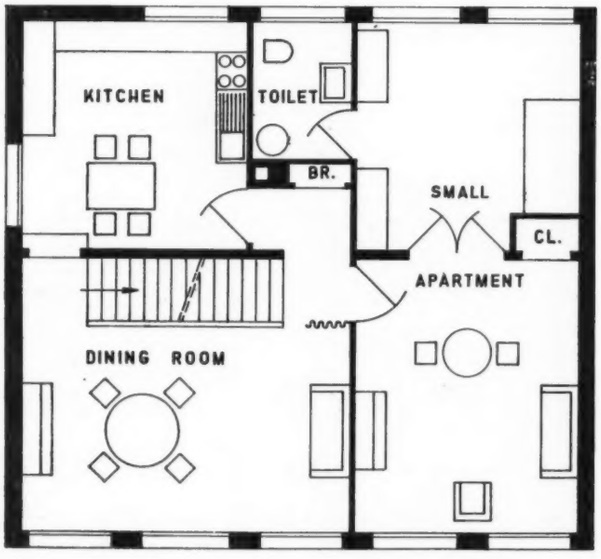
THE LIVING ROOM (above) showing the stair which leads up from the hall and continues to the dining room on the floor above. It is part of the room, fitting into the layout and creating new perspectives of the room by the changing eye-height of the person on the stair.



FIRST FLOOR PLAN. The stair which comes up from the hall on the ground floor opens directly into the living room. The space of a separate staircase is saved or partly given to the living room. Bedrooms and bath are directly accessible from the head of the stair. Living room windows face south. The boy's and girl's bedrooms may be combined into one large room for playing, by opening of the double doors between the two rooms. Adequate storage space for clothes, linen and books is built-in and distributed for each room as needed.

Photographs by Finsler

HOUSE IN ZURICH, SWITZERLAND

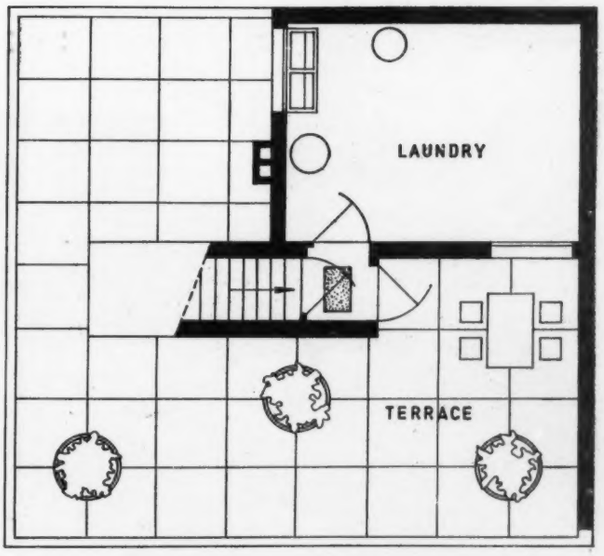


KITCHEN. Since the kitchen is also used as a breakfast room it is ample in size. Cabinets are at most convenient heights and there are no horizontal surfaces above eye-level where control of dust collection would be difficult. Because the kitchen is the workshop of the housewife for a good part of the day a pleasant outlook from at least one window has been thought a good feature.

SECOND FLOOR PLAN. Straight up from the living room leads the open stair into the dining room. Because of the restricted building area these rooms are arranged above each other instead of side by side. Through the open stairwell, close connection of the two floors is maintained and interesting perspectives are created by the introduction of the third dimension, the vertical relation. The kitchen on this floor has the advantage of being separated from living and bedrooms and as it is above them, odors from cooking will not travel through the rooms but escape to the roof. A small apartment for a relative of the owner was part of the requirements. Its location on this floor afforded better separation from the rest of the house.

DESIGNED BY ALBERT FREY

THE ROOF TERRACE. The sitting space here enjoys full privacy, light, air, sun or shadow as may be desired, and a magnificent view.

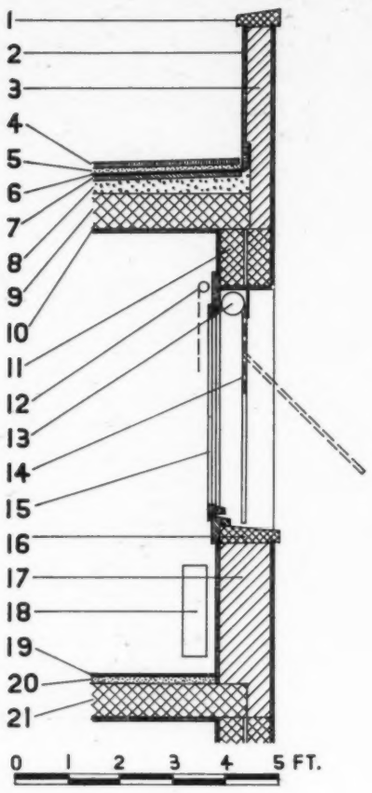


ROOF TERRACE PLAN. The flat roof is almost entirely given over to a terrace for outdoor living, sun-bathing and playing. One flight of stairs from the kitchen, it is ideal for outdoor eating. Flowers and shrubs grow well in the abundant light and air. The terrace gives privacy from neighbors and from street noises. The laundry has been located on this floor because the ordinary place for this room, the basement, was too low for drainage to the street sewer. Clothes drying is done on part of the terrace, convenient and clean.

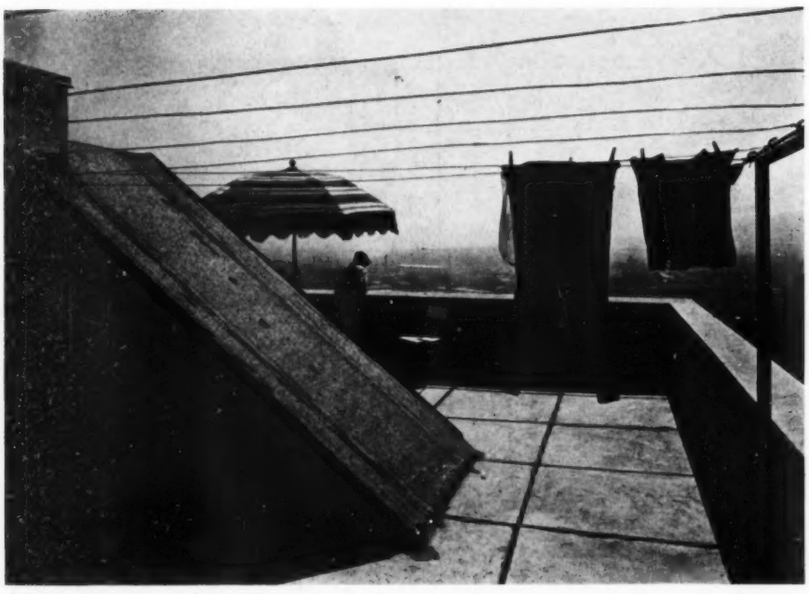
HOUSE IN ZURICH, SWITZERLAND

DESIGNED BY ALBERT FREY

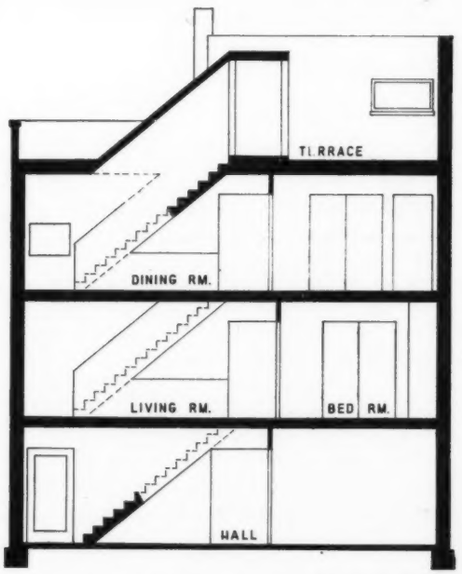
DETAIL SECTION, VERTICAL, THROUGH FLOOR, WALL, WINDOW AND ROOF TERRACE



(1) Parapet cover of synthetic stone.
(2) Cement stucco.
(3) Cement tile wall, 6-inch.
(4) Cement terrace floor slabs, 3 to 4 feet square, 1½ inches thick.
(5) ½ inch sand to allow for difference of expansion and drainage of rain water.
(6) Built-up roofing, 3-ply felt and asphalt.
(7) 1-inch cork insulation applied with hot asphalt.
(8) 3 to 6-inch cinder concrete for insulation and to provide pitch towards interior drain pipe.
(9) Reinforced concrete floor with hollow tiles dividing concrete into rib and slab.
(10) Plastered ceiling.
(11) Precast concrete lintel, 2 pieces with airspace to reduce transmission of heat or cold.
(12) Shade.
(13) Roll-up shutter made of wood lath with spring steel bands. ½" spaces between lath give circulation of air.
(14) Channel rails at sides for shutter. May be put out like awning.
(15) Double-glazed in-opening casements, wood.
(16) Synthetic stone sill.
(17) 12-inch hollow tile wall, terra cotta blocks.
(18) Thin steel tubing radiator, for hot-water circulation. Quick heat conductance, light weight, crackproof to freezing.
(19) Linoleum flooring.
(20) Mastic floor insulation.
(21) Reinforced concrete floor with hollow terra cotta tile blocks.



PART OF THE ROOF TERRACE is used for drying laundry. The wires used for hanging are of stainless steel.



CROSS SECTION showing how the different rooms are connected by the stairway. The line of travel from ground to roof is the shortest possible. The stair openings favor air movement between floors, helping uniform heating in winter and quick cooling in summer by opening of terrace doors allowing the rising warm air to escape.

OFFICE OF SCHOEPPL AND SOUTHWELL, ARCHITECTS

MIAMI BEACH, FLORIDA

Building: reinforced concrete and cement block walls on concrete piling; steel sash, Detroit Steel Products Co.; Ludowici white interlocking tile roof; plaster throughout, hard white finish, Certain-Teed Products Corp.

FIRST FLOOR

ENTRY AND SECRETARY'S OFFICE: quarry tile floor; wood cornice; walls and ceiling painted bone white; woodwork glazed dirty white.

OFFICE NO. 1: asphalt tile floor; wood cornice; walls and ceiling painted bone white; woodwork black; floor black, red and white.

OFFICE NO. 2: brown linoleum floor; brown wainscot; white walls and ceiling; wood cornice; shelves and woodwork trimmed in red.

OFFICE NO. 3: green asphalt tile floor; green wainscot and trim; white walls and ceiling.

SECOND FLOOR

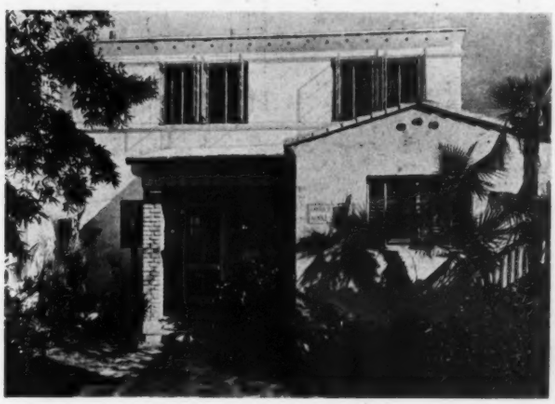
STORAGE FILE ROOM: asphalt tile floor. J-M Flexboard wainscot, white walls and ceiling.

DRAFTING ROOM: green asphalt tile floor, green wainscot and trim, white walls and ceiling.

Benjamin Moore & Co. paints used throughout. Venetian blinds at all windows. Indirect light in all rooms.

SCHOEPPL & SOUTHWELL,
ARCHITECTS

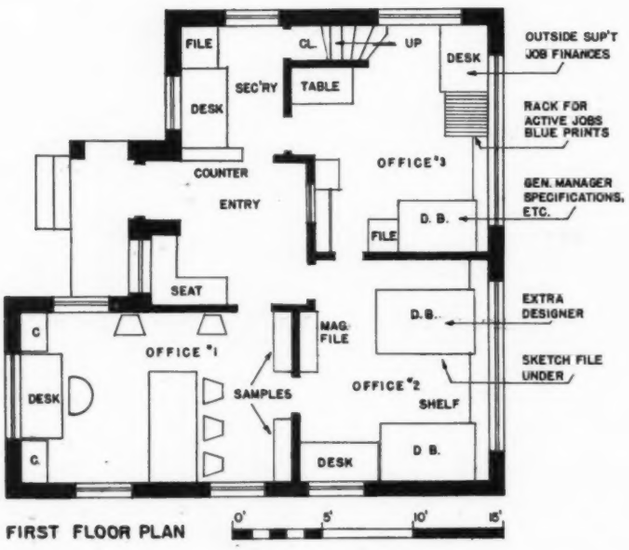
Photographs by Gottscho



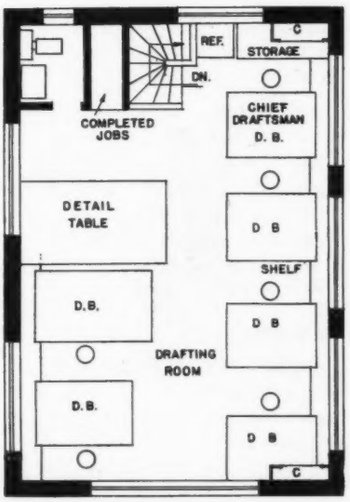
Photographs by Gottscho

OFFICE OF SCHOEPPL AND SOUTHWELL, ARCHITECTS — MIAMI BEACH, FLORIDA

SCHOEPPL & SOUTHWELL,
ARCHITECTS



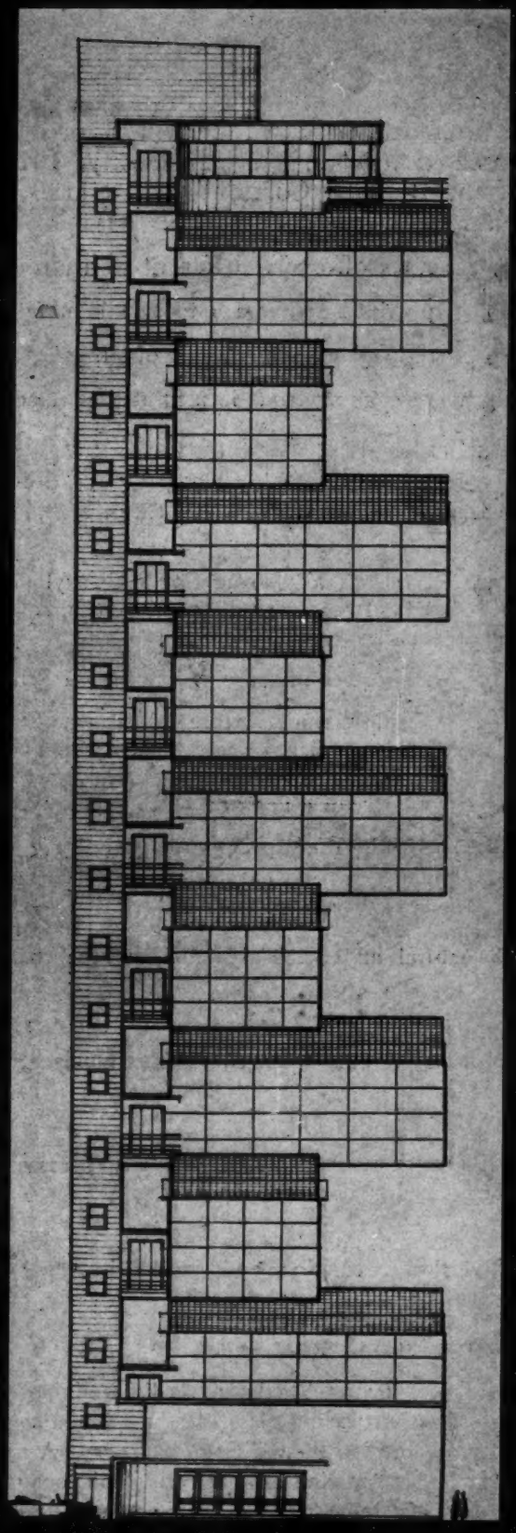
FIRST FLOOR PLAN



SECOND FLOOR PLAN

PLANS FOR A CONTEMPORARY MUSEUM, NEW YORK CITY

HOWE AND LESCAZE, ARCHITECTS



SCHEME 4

FRONT VIEW

small squares indicate glass surface

A PROPOSED
MUSEUM OF CONTEMPORARY ART FOR NEW YORK CITY

by HOWE AND LESCAZE, ARCHITECTS

On June 2, 1930, the architects prepared drawings for a Museum of Contemporary Art with a proposed location in New York City. Previous to this the architects, at the request of the Building Committee of a local museum, had prepared three preliminary schemes.

Each of the preliminary schemes offered a different solution of the lighting problem:

SCHEME 1 provided continuous topside lighting through ribbon windows;

SCHEME 2 through a façade entirely of glass;

SCHEME 3 through skylights located at the setback of each floor.

In each of these three schemes there were only two possible sources of light: from the front, facing the street; and from the rear, facing the court. Further studies by the architects led to the development of Schemes 4, 5 and 6, shown on the accompanying pages.

SCHEME 4 combines topside lighting with skylighting. Each gallery obtains light from every direction—north, south, east, and west—as well as through a skylight;

SCHEME 5 is, in some measure, a variation of Scheme 4;

SCHEME 6 develops some features of Scheme 2 and offers a novel solution of the traffic problem: visitors would be taken up to the uppermost floor and would go down through the galleries by means of a quarter of a flight of stairs at every exhibition room.

The vital factors, in the order in which they should be considered in designing a museum, are:

1 LIGHT
Correct supply of both natural and artificial light, and the control of their intensity and direction.

2 DISPLAY AREAS
Adequate wall and floor space, properly arranged for the intelligent display of diversified exhibitions.

3 VENTILATION
Constant maintenance of the temperature and humidity necessary for the safekeeping of paintings, notwithstanding varying outside conditions.

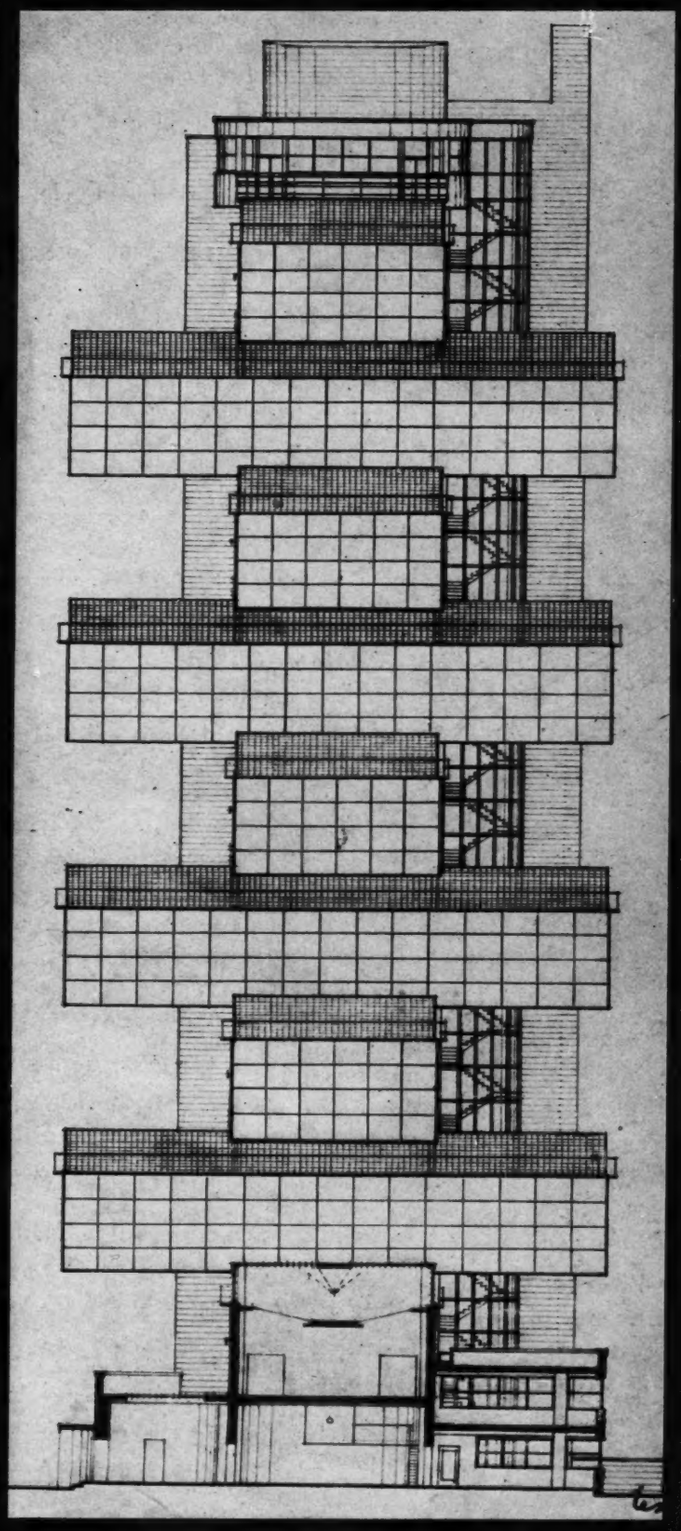
4 TRAFFIC
Concentrated means of vertical circulation, and simplified method of circulation on each floor.

5 STORAGE
Storage and facilities for receiving, shipping, and repairs.

LIGHT Above each gallery is a light-mixing chamber with sides and top of structural glass. Its base is the continuous diffusing sash constituting the ceiling of a gallery. A model of such a gallery with light-mixing chamber was built, one-quarter of its actual size, at the request of the architects and, under their supervision, by the Structural Glass Corporation. The purpose was to determine the

PLANS FOR A CONTEMPORARY MUSEUM, NEW YORK CITY

HOWE AND LESCAZE, ARCHITECTS



SCHEME 4

SIDE VIEW
section through first
and second floors

efficiency of the chamber. The tests by a photometer (a meter for gauging the intensity of illumination) established that:

a) The intensity varied from thirteen to eighteen foot-candles or lumens per square foot. In consultation with the architects a lighting expert stated that experiments had shown fifteen foot-candles to be the ideal illumination for paintings.

b) The light is strongest on the wall space between a line drawn at four feet, and another at eight feet from the floor, in other words, within the picture hanging space.

c) The intensity in the present premises of the museum is from five to nine foot-candles.

The detailed report of these tests is in the files of the architects.

For the regulation of the light, the chamber is equipped with light-controlling blades and reflectors. A photo-electric cell automatically controls the gradual closing of the blades as daylight increases. It also controls their opening as daylight decreases, and finally turns on the electric light in the reflectors as darkness approaches.

The light chamber is easily cleaned from an outside balcony that encircles it, and is of sufficient height to permit of easy access for workmen.

The outlook from the glass-inclosed staircase, and the street view from the broad window in the lobby of each floor relieve possible museum fatigue.

DISPLAY AREAS The total length of unencumbered wall available for hanging pictures in

each east-west gallery	is 136 linear feet;
each north-south gallery	212 linear feet.

The total clear floor area in

each east-west gallery	is 1,344 square feet;
each north-south gallery	1,936 square feet.

VENTILATION The light-mixing chamber also contains heating pipes as well as ducts for humidifying and ventilating which, through grilles, control the atmosphere of each gallery.

TRAFFIC An information booth is placed on the entrance floor. Three passenger elevators and a glass-inclosed staircase lead to the galleries above; in rush hours a fourth elevator, otherwise for freight, may be used for passenger service. The arrangement of the galleries eliminates traffic confusion even on a crowded day. Each gallery is a unit in itself with its entrance and exit leading only to the elevators and staircase, not into any other room. Thus there is no cross traffic and, while in one gallery, there are no glimpses of more pictures in adjoining galleries to distract the attention.

MATERIALS The facing of the exterior walls is a smooth and refracting surface such as marble or white glazed brick; the finish of the interior walls is a smooth plaster painted a flat and rather dark color.

DESCRIPTION OF SCHEME 4

The building is composed of an arrangement of horizontal blocks placed above one another and at right angles to each other. There are nine of these blocks, five short ones extending east to west, and four long ones extending north to south. Each constitutes an exhibition gallery. All of them abut a tall narrow tower which contains the elevators, glass-inclosed main staircase, and the fire stairs. Besides these nine gallery-blocks, the building contains two basements, a main floor with auditorium, and a roof restaurant with open terrace.

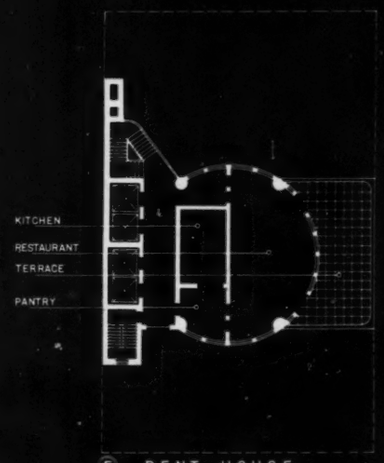
SUB-BASEMENT: heating plant, ventilating and humidifying units, electric switchboards and transformers

PLANS FOR A CONTEMPORARY MUSEUM, NEW YORK CITY

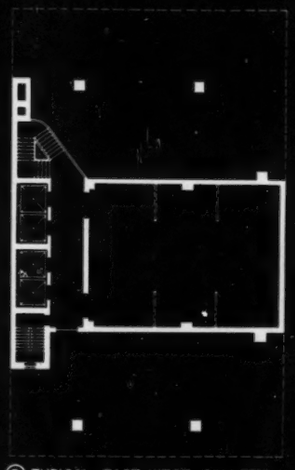
HOWE AND LESCAZE, ARCHITECTS

SCHEME 4

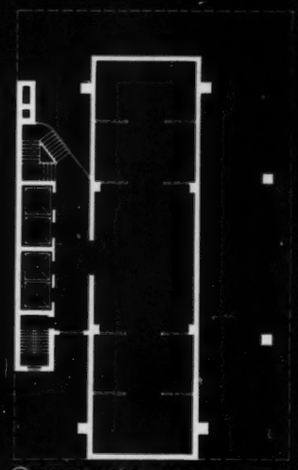
FLOOR PLANS



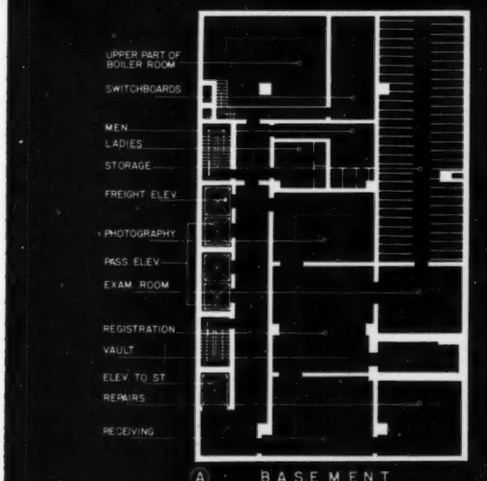
Ⓕ PENT HOUSE



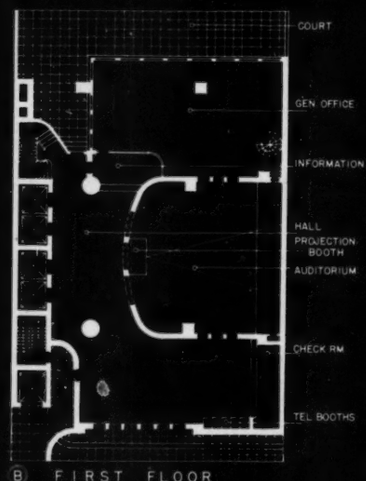
Ⓓ TYPICAL EAST-WEST GALLERY



Ⓔ TYPICAL NORTH SOUTH GALLERY



Ⓐ BASEMENT



Ⓑ FIRST FLOOR

Ⓒ MEZZANINE

BASEMENT:	rooms for receiving, repairs, storage, registration, examination, photography vault for valuables, men's and women's rest rooms
FIRST FLOOR:	main entrance—hall, auditorium, stairs, elevator lobby, general offices, freight entrance, open court
MEZZANINE:	private offices, board-library room
FLOORS 2, 4, 6, 8, 10:	east-west galleries
FLOORS: 3, 5, 7, 9:	north-south galleries
PENTHOUSE:	restaurant and open terrace

Light is of such paramount importance in a museum that it has dictated the block form of Scheme 4. In order to obtain direct and satisfactory lighting for each gallery, some potential building space has been given over to providing an efficient distribution of light. The following figures indicate that Scheme 4 saves approximately $28,018 by converting 37,358 potential cubic feet into a source of direct daylight lighting for each gallery.

A comparison of Scheme 4 with revised Scheme 1, which would contain the maximum cube permitted by law, shows:

	SCHEME 1	**SCHEME 4**
Height from floor to floor	14 feet	23 feet
Number of floors	10	10 and penthouse
Total height above curb	141 feet	*226 feet
Total cube (including two basements)	316,240 cu. ft.	778,882 cu. ft.
Total cost estimated at 75c a cubic foot	$612,180	$585,000

*Scheme 4 encroaches somewhat on the existing building code, but the architects feel that, because of the open block arrangement, the adjoining buildings and streets gain so much extra light and air that the Trustees can easily obtain the necessary permits from the Building Department.

If two building periods are to be considered for the erection of the museum, the architects recommend that the first one include the first five floors. This would give, beside the two basements, the entrance floor with its auditorium and offices, and four floors of exhibition galleries.

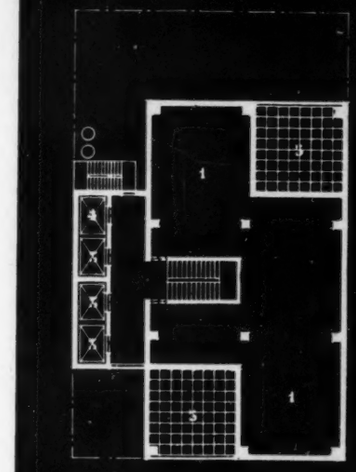
	EXISTING GALLERIES HECKSCHER BUILDING	1ST BUILDING PERIOD **SCHEME 4**	COMPLETED BUILDING **SCHEME 4**
LIGHT	**Artificial**	**Daylight and Artificial**	**Daylight and Artificial**
Total floor area	4,235 square feet	28,100 square feet	43,000 square feet
Galleries net floor area	2,800 " "	6,560 " "	14,460 " "
Offices, etc.	360 " "	2,500 " "	2,500 " "
Storage, etc.	150 " "	3,500 " "	3,500 " "
Wall length for pictures	390 linear feet	696 linear feet	1,528 linear feet
Same with subdivisions		1,096 " "	2,416 " "
Restaurant		1,100 square feet	1,100 square feet
Cost of land and building		$567,500	$887,500
Rent or 6% interest on cost		$ 34,050	$ 53,250

KEY TO NUMERALS ON PLANS OPPOSITE

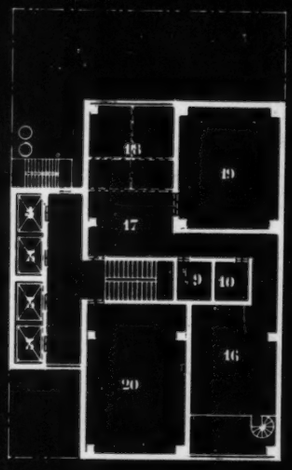
1 Exhibition Space	10 Ladies' Rooms	19 Board Room, Library
2 Entrance Hall	11 Checkroom	20 Examination Room
3 Passenger Elevator	12 Information	21 Receiving Room
4 Freight Elevator	13 Auditorium	22 Registration Room
5 Glass Ceiling	14 Freight Entrance	23 Storage Room
6 Restaurant	15 Telephone Booths	24 Photography Room
7 Terrace	16 General Office	25 Vault
8 Kitchen	17 Hall	26 Boiler Room
9 Men's Rooms	18 Directors	27 Switchboards

PLANS FOR A CONTEMPORARY MUSEUM, NEW YORK CITY

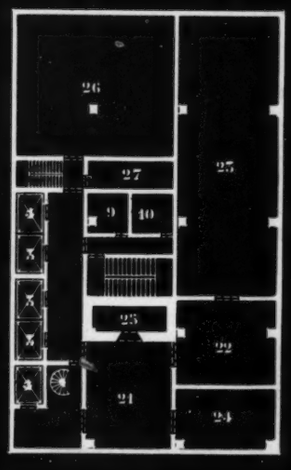
HOWE AND LESCAZE, ARCHITECTS



E GALLERY

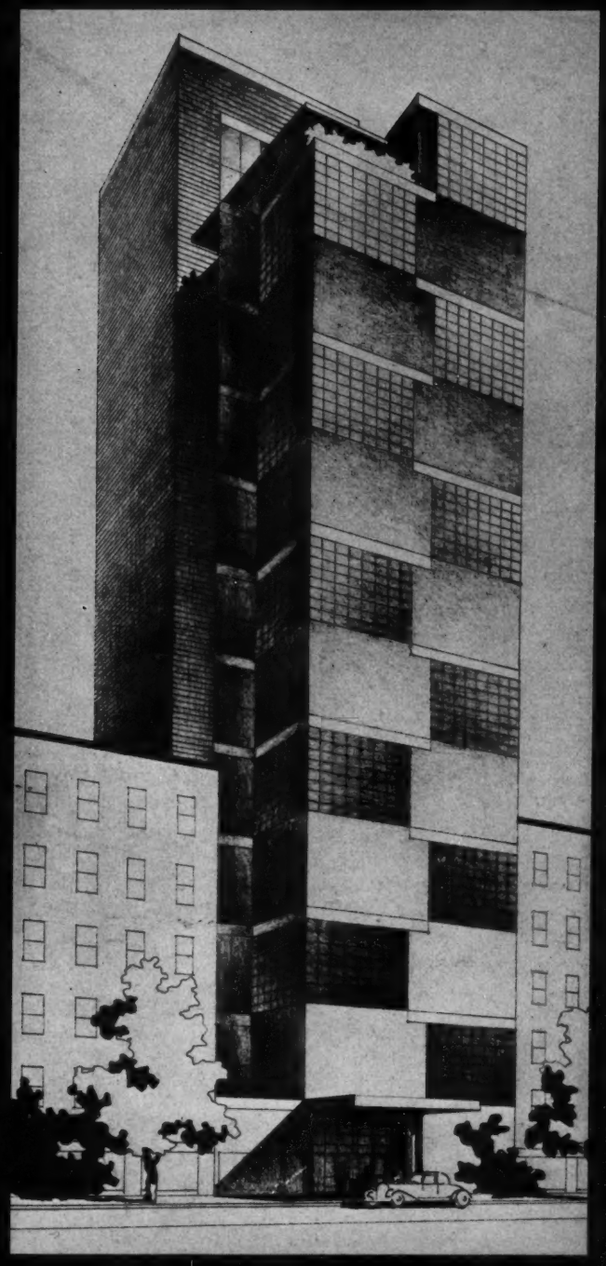


C MEZZANINE



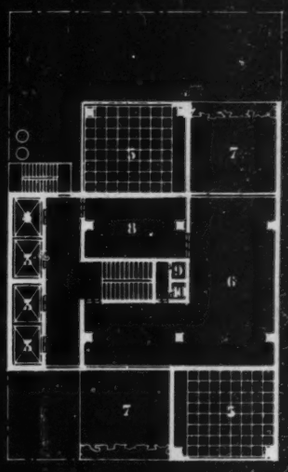
A BASEMENT

0 5 10 20 30 40

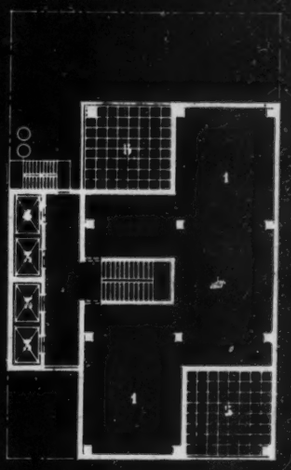


SCHEME 5

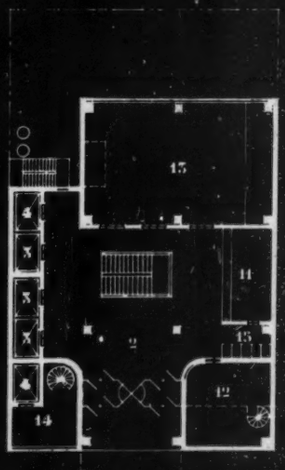
staggered light chambers give daylight to the galleries



F PENT HOUSE



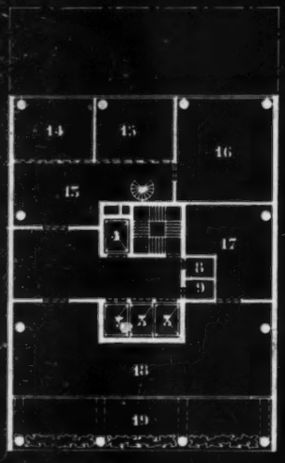
D GALLERY



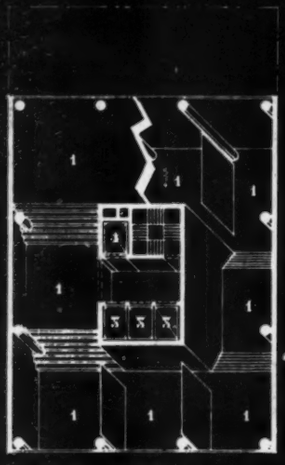
B FIRST FLOOR

PLANS FOR A CONTEMPORARY MUSEUM, NEW YORK CITY

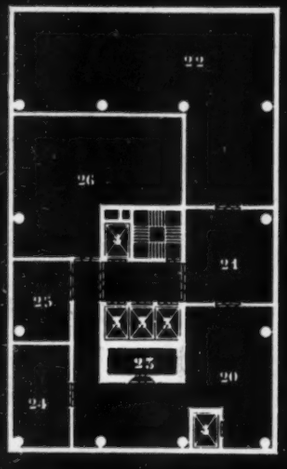
HOWE AND LESCAZE, ARCHITECTS



PENTHOUSE

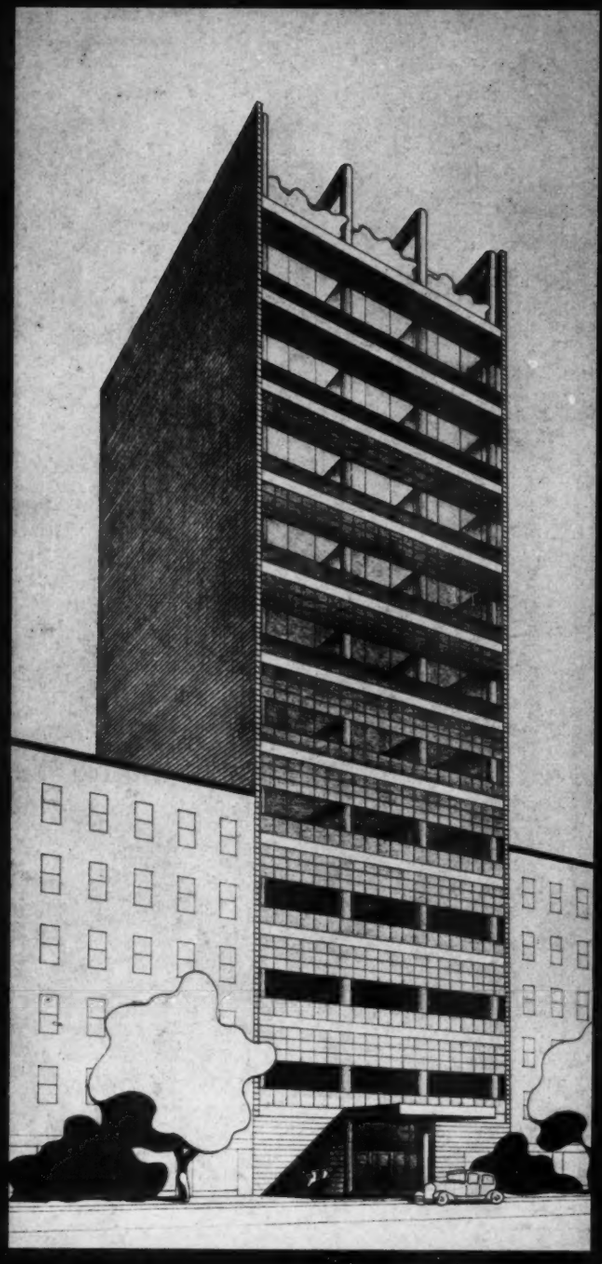


TYPICAL GALLERY



BASEMENT

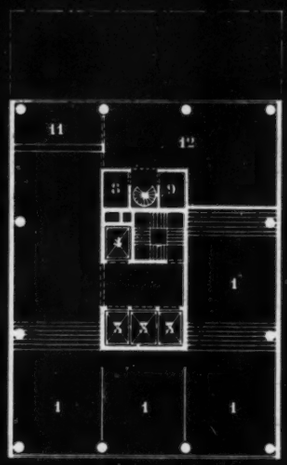
0 10 20 30 40



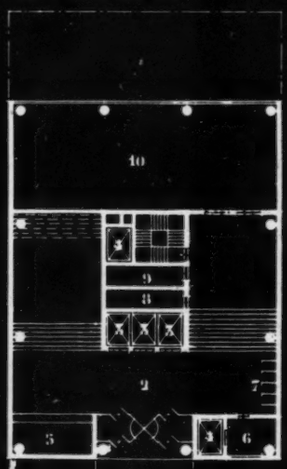
SCHEME 6

entire glass front with alternating strips of clear and opaque glass

1 EXHIBITION SPACE
2 ENTRANCE HALL
3 PASSENGER ELEVATOR
4 FREIGHT ELEVATOR
5 CHECK ROOM
6 FREIGHT ENTRANCE
7 TELEPHONE BOOTHS
8 MENS ROOMS
9 LADIES ROOMS
10 AUDITORIUM
11 INFORMATION
12 GENERAL OFFICE
13 HALL
14 ASSOCIATE DIRECTOR
15 DIRECTOR
16 BOARDROOM, LIBRARY
17 KITCHEN
18 RESTAURANT
19 TERRACE
20 RECEIVING ROOM
21 REGISTRATION ROOM
22 STORAGE ROOM
23 VAULT
24 PHOTOGRAPHY ROOM
25 SWITCHBOARDS
26 BOILER ROOM



STARTING GALLERY



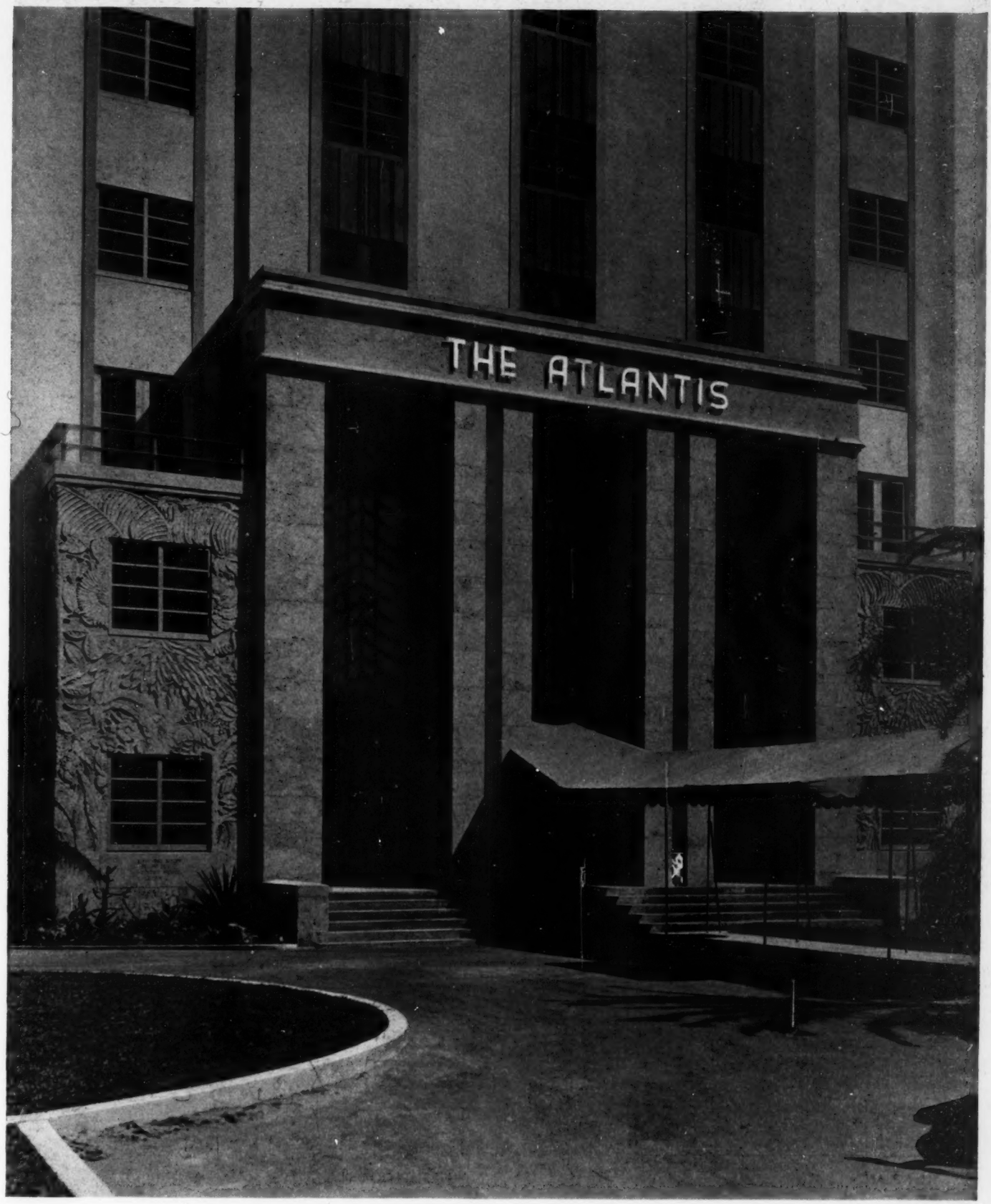
FIRST FLOOR

ATLANTIS HOTEL

MIAMI BEACH, FLORIDA

L. MURRAY DIXON, ARCHITECT

Photographs by Gottscho

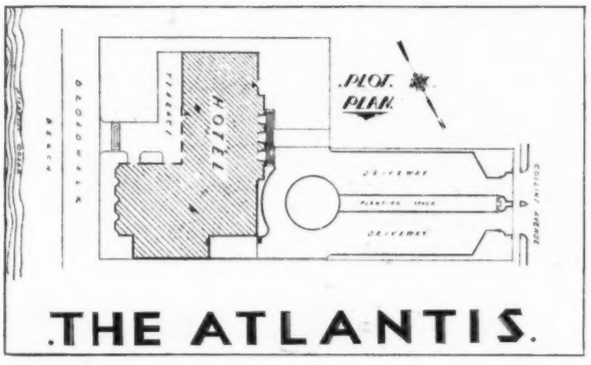


Photographs by Gottscho

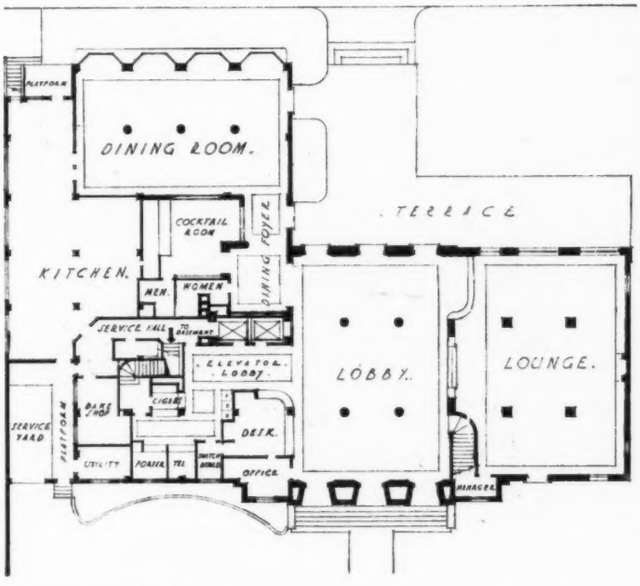
ATLANTIS HOTEL

MIAMI BEACH, FLORIDA

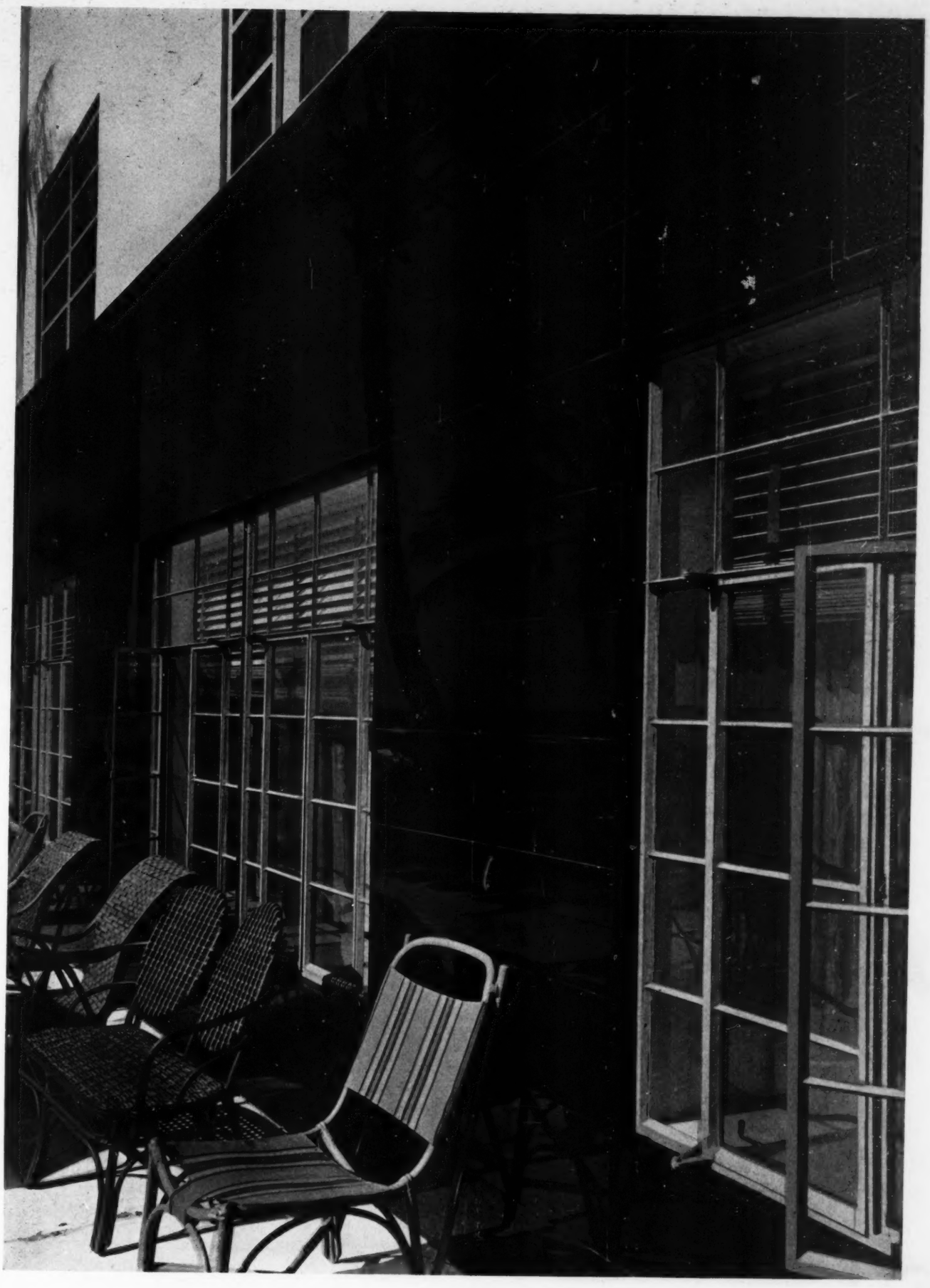
L. MURRAY DIXON,
ARCHITECT

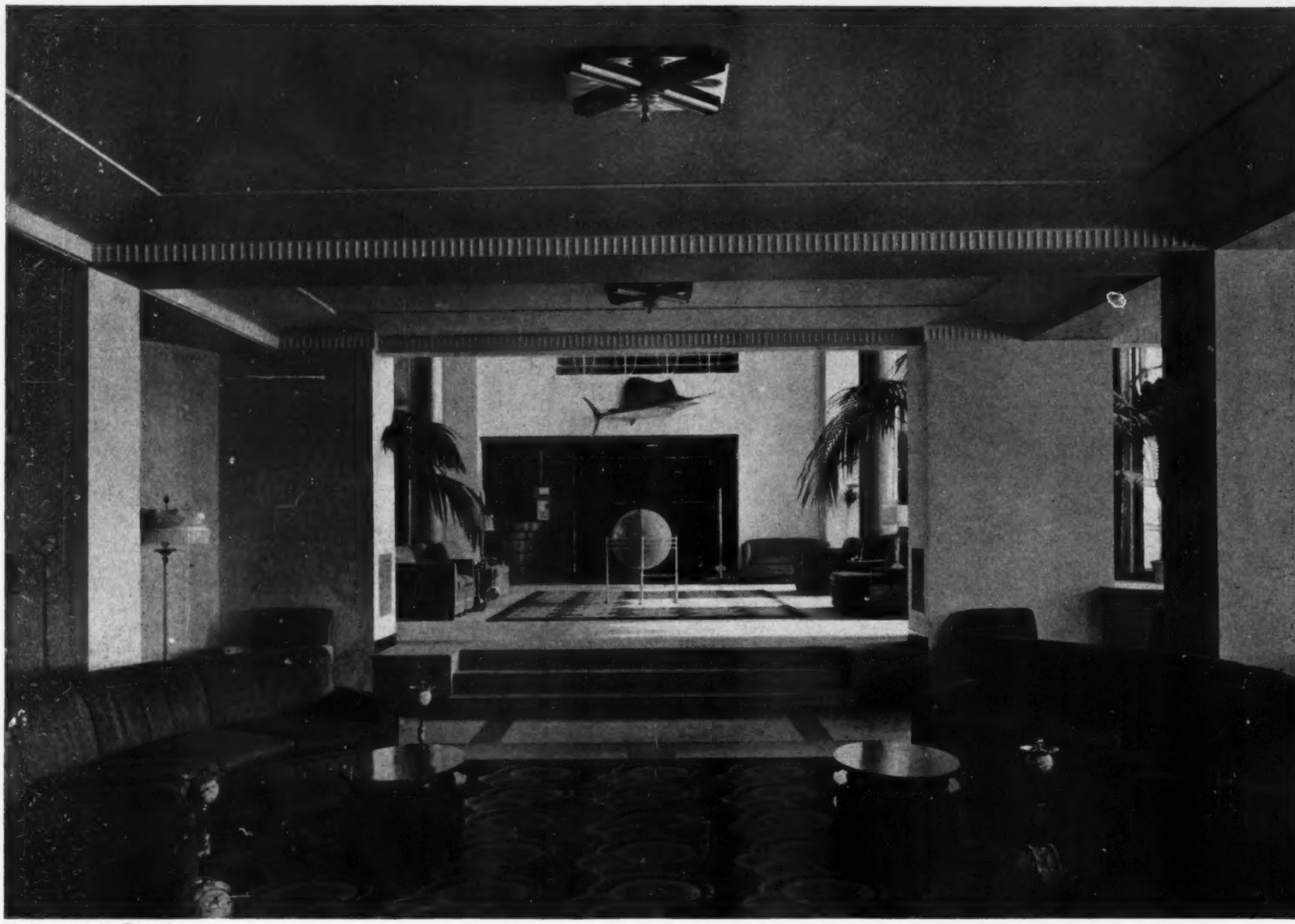


PLOT PLAN



FIRST FLOOR PLAN

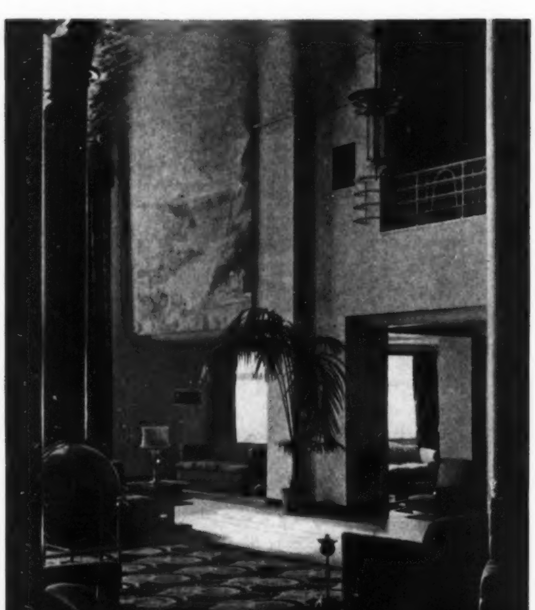




Photographs by Gottscho

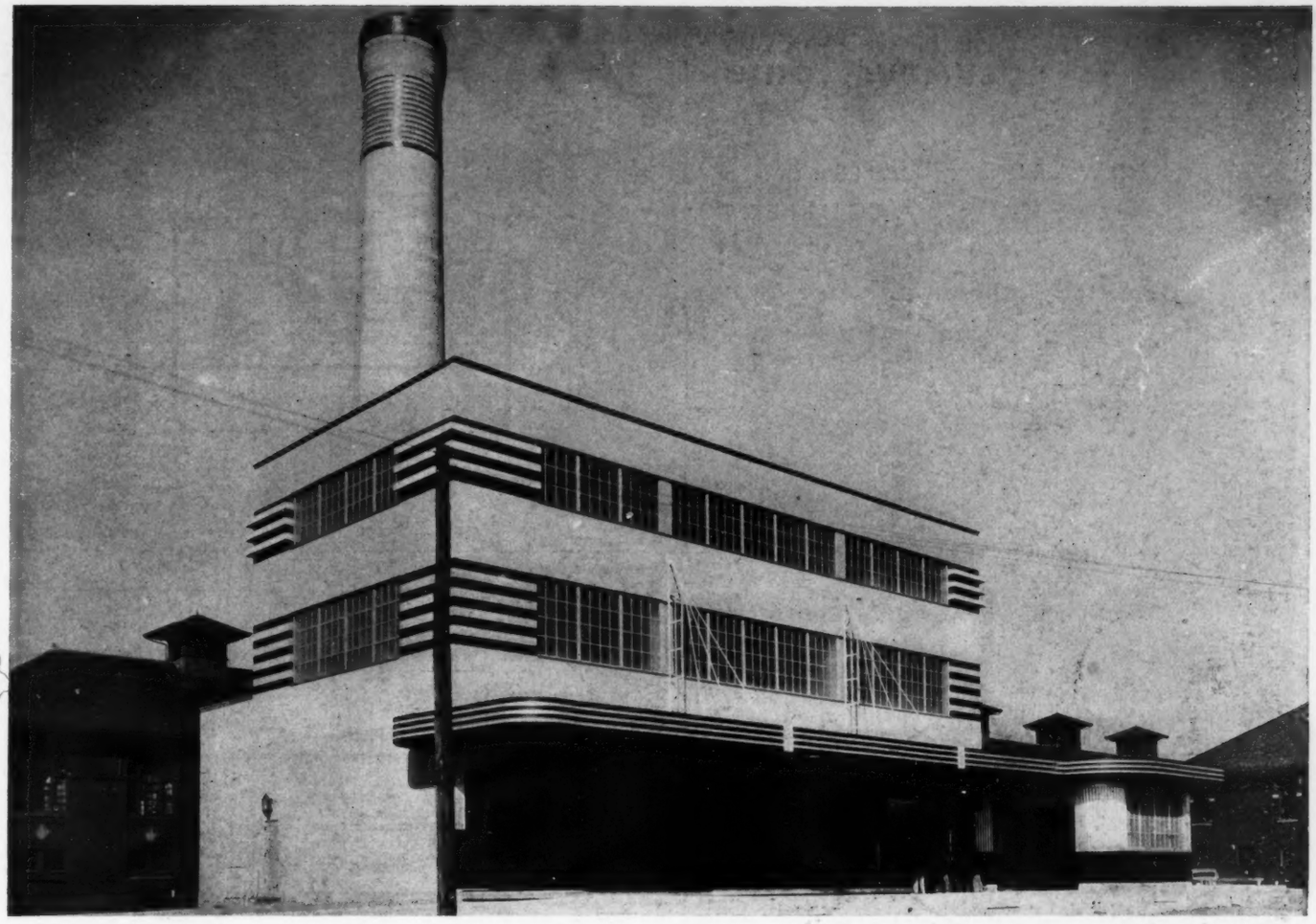
MAIN LOUNGE LOOKING TOWARDS LOBBY

ATLANTIS HOTEL — MIAMI BEACH, FLORIDA



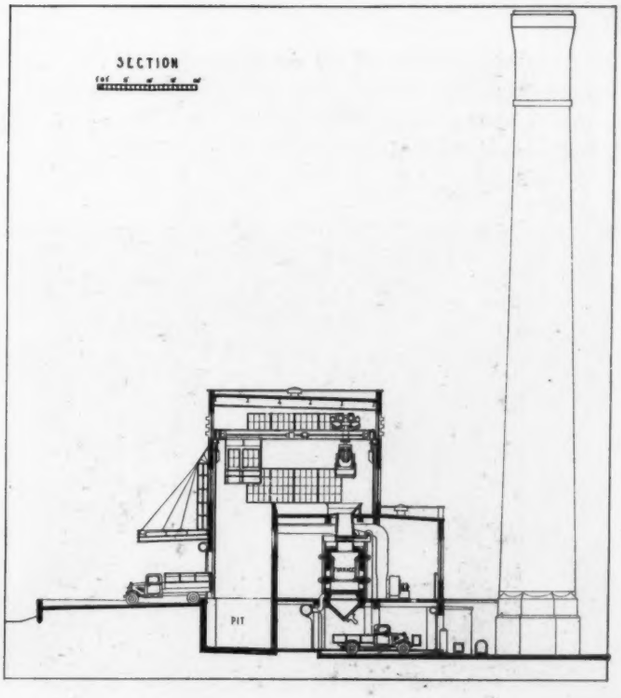
L. MURRAY DIXON,
ARCHITECT

TYPICAL FLOOR PLAN



REFUSE INCINERATOR — COLUMBUS, OHIO

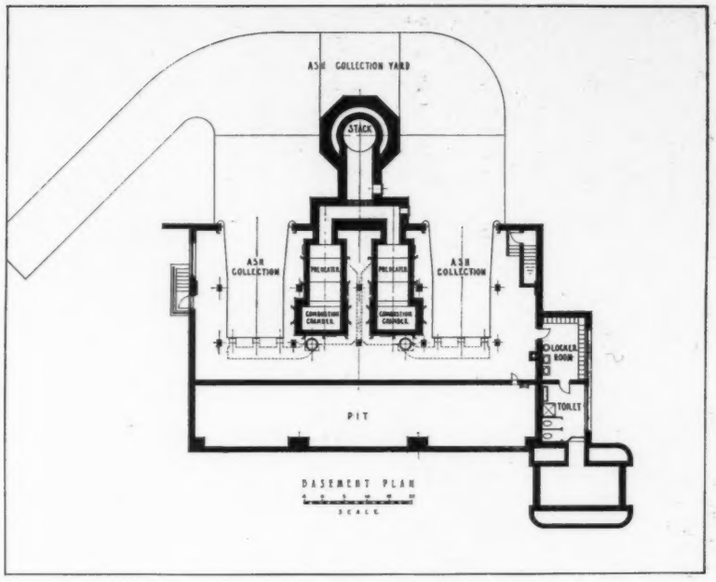
EDWARD A. RAMSEY,
ARCHITECT



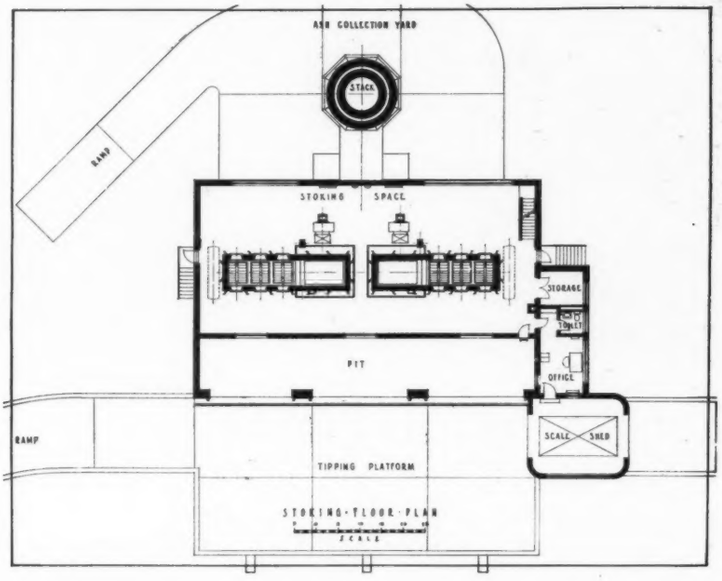
Cross section of plant showing relation between refuse deposited by truck (lower left) to ash removed by truck (lower right).

REFUSE INCINERATOR 1
COLUMBUS, OHIO

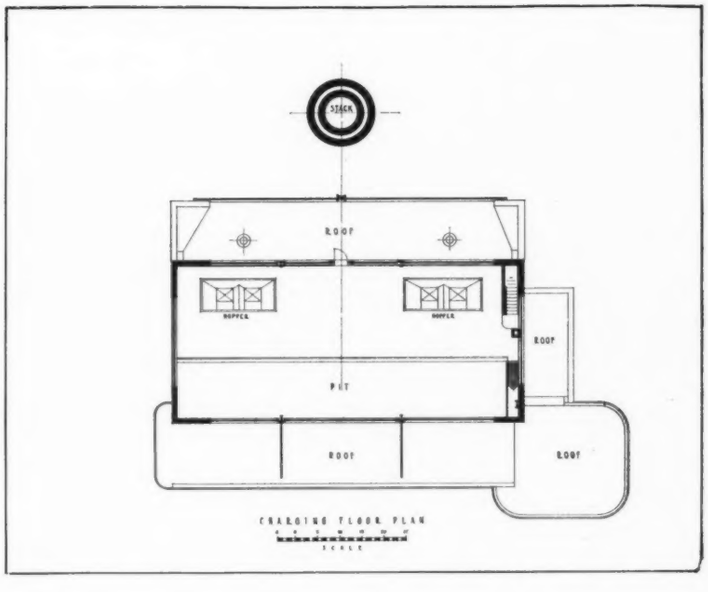
EDWARD A. RAMSEY,
ARCHITECT



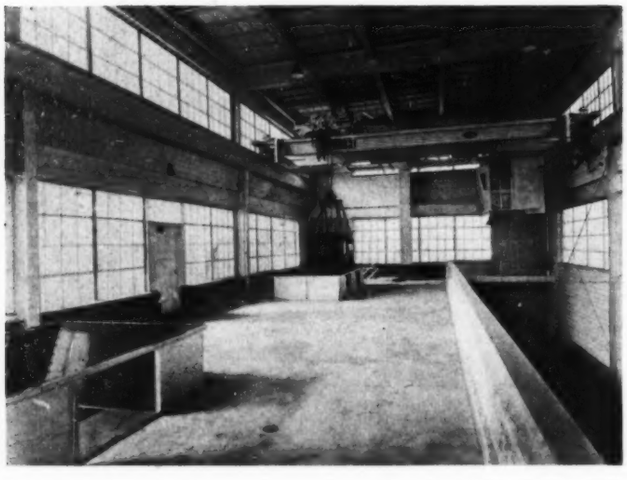
2



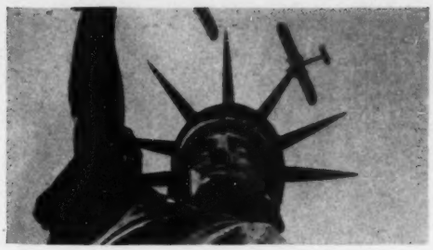
3



Refuse, brought by truck to the tipping platform (2) is dumped into the pit. Traveling cranes pick it up and dump it through hoppers (3) into the furnace chamber. The ash is then dropped into trucks on the basement level (1) where it is hauled out.



NOTES ON



MURALS BY PHOTOGRAPHY

by DRIX DURYEA
of Drix Duryea, Inc.

Murals by photography have become invaluable for the reproduction of any subject, photographic or otherwise, to form a design to the required scale at nominal cost. They are appreciated by architects because the room does not have to be designed or changed to fit them; the murals themselves can be adapted to rooms of any size or character and can be designed to preserve and bring out the best architectural features of the room.

Because of the unlimited sources from which subject material can be had for murals by photography, a great variety of treatment is possible. The murals may be in any monotone color desired or may be hand colored in transparent oils to harmonize with the existing color scheme of the room.

In period rooms murals by photography have an important place. The architect may have seen plates in books in museums and libraries that are exactly the designs necessary

Two of a series of twelve Photo-Montages, "Cosmopolitan New York," used as part of a modern decorative scheme for a bridge club.

Photographs by Drix Duryea

Photographs by Drix Duryea

Residence of Robert Sanderson, Darien, Connecticut. Mural in color from snapshots of Bermuda taken by the owner.

to make the wall treatment as authentic as the other appointments, and it is of value to know that these plates may be reproduced in proper scale and color.

Heretofore, wall designs have been confined to a certain radius of technique and form of execution, due to physical and mechanical limitations imposed upon the artist in large-scale delineation for wall decoration. Many of the more delicate and subtle techniques have been impracticable in a mural. Murals by photography have made possible the transition of any form of technique into mural scale and open a limitless field for the application of suitable designs for the decorator.

Murals by photography are not confined to photographic subjects. The architect may choose any form of illustration to carry out the desired composition. Old prints and maps, etchings, woodcuts, Persian miniatures, illustrations from magazines of the "Gay Nineties" and old fashion plates and original drawings done in small scale are sources from which excellent material may be obtained. A scenic mural may be composed from old prints of historic and traditional significance to the client and thereby a mural is created, the theme of which is both decorative and applicable.

Such sporting series as "A Trip to Brighton" and "The Quorn Hunt" have been used to form the decoration in the sportsman's home. Old shooting and golfing prints make interesting and striking panels for game rooms and bars. Photographs of sail fishing, yacht racing and aviation have brought life and action into the home of the outdoor enthusiast.

Classical groups on Wedgewood plates or plaques have been effectively embodied in a screen design. Rendered drawings and etchings have been reproduced and finished in soft monotones to coincide with the color scheme of the room. City apartment rooms with dull walls have been brightened up by the installation of a dummy casement window with

Screen from black and white pencil drawing by Major Felten.

Photograph by Drix Duryea

"Blossom Room," Huyler's Restaurant, Chicago. Subjects are from photographs of cherry blossoms in Washington, D. C. Murals are done in black and white with a tint to each blossom.

a photo-mural background showing a landscape or any other subject that gives depth or light.

The confining walls of penthouse gardens and terraces have been decorated with photo-mural vistas.

Subjects that give a sense of depth, such as airplane views or skylines and country scenes, can relieve the confined feeling of the small room.

Some very interesting murals have been created in montage form. We take a group of photographs and compose a design from them, preserving the proper balance of black and white as well as the value of the story that the miscellaneous subjects tell. Industrial concerns have made use of this form of design although some very interesting montages have been made for installation in game rooms of private houses.

Photo-mural paper is made in strips 40 and 50 inches wide and up to any required length. The best surface for a permanent installation is a good plaster wall. The method is first to size the wall and mount muslin where the mural is to go. When the muslin has had sufficient time to dry, the mural is mounted on the muslin and the joints are overlapped, but before they are applied the edges of the strips are carefully sanded down so that the overlapping represents a single thickness of paper. The final step is to apply a coat of flat varnish, which not only protects the surface but makes it possible to clean it from time to time.

If the murals are to be rendered in color, a coat of special gelatin is applied to the surface of the mural and a transparent medium is then applied which makes the surface ready for color. Transparent oils are used for the color rendering and are applied by hand.

Panels, small murals and overmantels can be mounted on a suitable composition board, finished and shipped from the studio ready for installation. In some cases murals of small area are mounted on

Mural in Aetna Life Insurance Company Building, Hartford, Connecticut. James Gamble Rogers, Inc., Architects.

Photograph by Drix Duryea

A display for the NBC control room showing the field broadcasting of a football game, Rose Bowl, Pasadena, California.

muslin backing, rolled up and delivered ready for hanging as a single unit. These two methods allow the coloring to be done in the studio.

In the case of treating acoustic installations, we have been most successful. Our murals installed in the rotunda of the National Broadcasting Studios in Rockefeller Center presented a particular problem. In this case it was essential to preserve the acoustic qualities of the room. The murals were completely to cover the rotunda wall, 180 running feet making the circumference. This wall was built of Transite tile and canton flannel was mounted directly on the tile; the mural was then mounted on the canton flannel. This gave a sound-absorbing base to the face of the acoustic tiles and proved a very satisfactory method of installation.

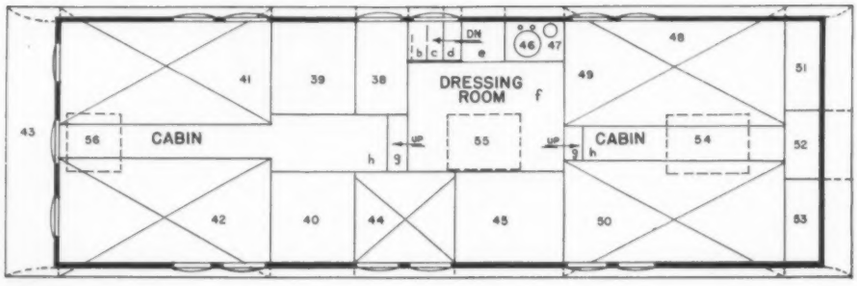
The following is a résumé of the advantage of our method of doing photo murals: The usual method of making photo murals is that of simple commercial enlarging and the apparatus in general use limits the size of the print and does not permit any flexibility in the transition of the subject as regards monotone values and accuracy in the matching and scale of each strip. The joining of these more or less unrelated small sections precludes unity of tonal values. The usual procedure in copying the subject for the mural is to photograph sections of the original subject and enlarge them, the mural being made from any number of negatives which necessarily vary in time of exposure, angles, and so forth. Our method consists of working from a single negative which completes the transition directly from the original. The result is one picture and therefore the whole is an organized unit. Our apparatus used in making the single negative from which the photo mural is made and for making the mural itself has been specially developed and designed for this purpose and is based on a system of lighting which allows for wide flexibility in the control of the three essential factors in making murals by photography: intensity (degree of brilliance), quality (range of monotone scale), and the balance and relation, both in depth of tone and scale of each strip that goes to make up the mural as a whole.

Through our specially-built equipment we are able to project to large areas without distortion and we are able to preserve the full quality of the negative and subject to the extreme dimension.

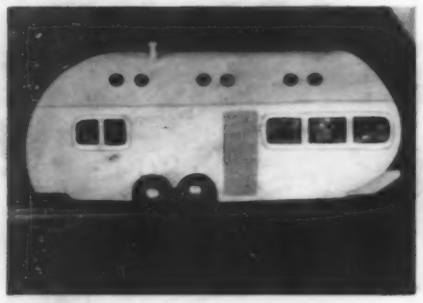
TECHNICAL NEWS AND RESEARCH JULY 1936

STRUCTURAL SYSTEMS AND DESIGNS

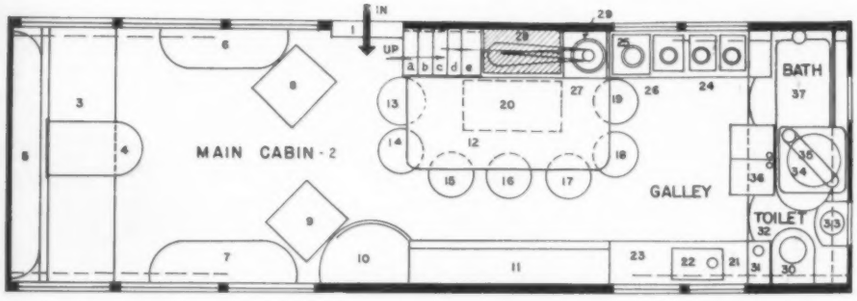
STRUCTURAL MOBILITY



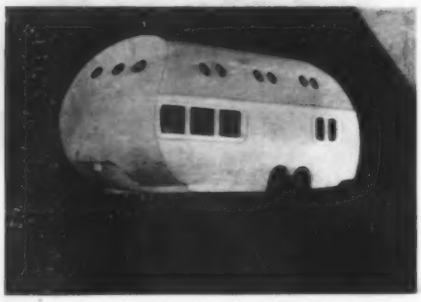
second floor plan



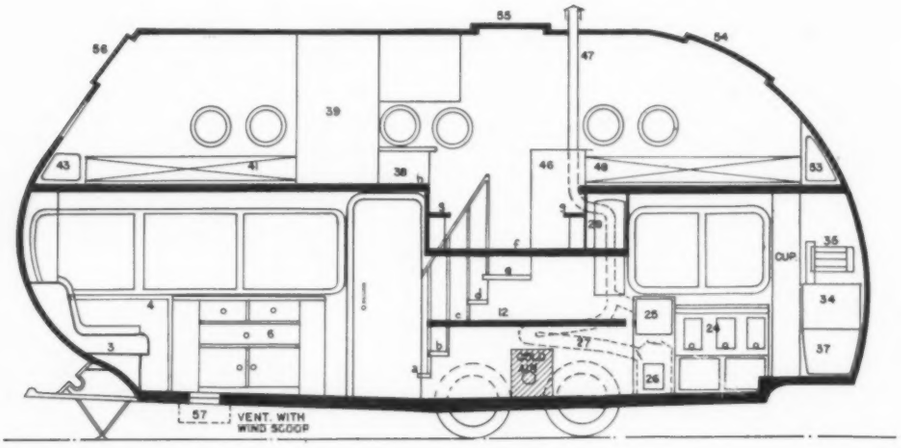
side



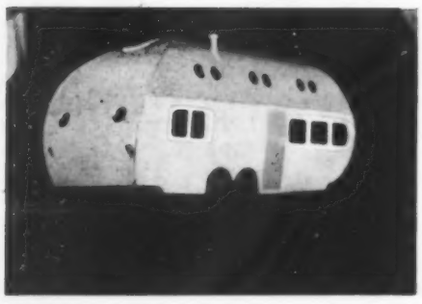
first floor plan



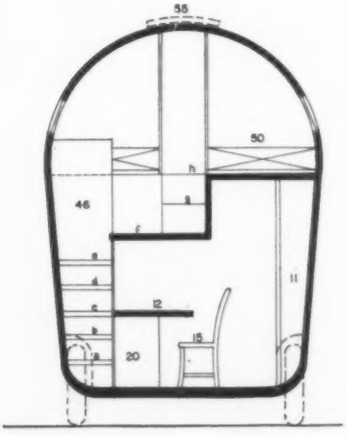
front



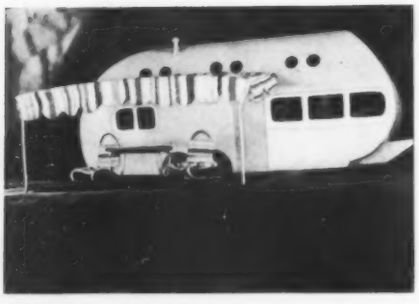
longitudinal section



rear



transverse section



model showing porch

Essentially an automobile trailer in principle, this mobile house by Corwin Willson supplies practically all the customary facilities of the average house. Space above the dining table, otherwise unneeded, is utilized to gain headroom in the dressing room on the second floor. (Patents applied for.)

TWO-STORY MOBILE HOUSE . . . . . FIVE ROOMS, BATH, LAUNDRY AND PORCH

This mobile house, designed by Corwin Willson of Flint, Mich., is capable of 100% prefabrication in the factory with delivery over the highway, completely furnished and ready for occupancy. Its calculated weight is approximately 3,500 pounds.

The unit shown in the accompanying drawings measures 25′ long, 7′ wide at wheelbase, and 8′ wide at bulge of sides. A height of 11′-9″ from ground to roof permits it to go under a 12″ bridge clearance. eadroom is 6′-4″ on first floor, 6′ in dressing room on second floor.

The house rides on a dolly of four individually sprung wheels. This dolly is easily detached and can be replaced by steel posts if the house is to be stood in one place for a considerable length of time. A porch, consisting of floor panels, roof awning and side netting, is carried inside the house in transit. Extra rooms, in the form of interlocking sectional panels, may be added to either side if the house remains on the same location during a season.

Construction: A hardwood-and-steel chassis with 1½″ insulation in floors supports curvilinear walls and roof by means of metal or laminar steam-bentwood ribs running from sill over roof to opposite sill. Second floor is partly suspended from ribs. Exterior is plywood with a bonded wrinkle facing (the designer's own product) capable of expansion and construction.

(A lightweight plastic material is also being developed by the designer which will permit the house to be molded in six large sections and weatherfaced with a glass-fiber textile; these sections could be nested for shipment to places where the parts may then be quickly assembled. A full stressed skin construction is likewise being experimented with.)

Every surface is a simple curve allowing use of flat stock bent to the ribs. This permits expansion and contraction without harm to the structure. Convex-curved front and rear ends intersect convex-curved sides at right angles, which makes unnecessary the use of compound curvilinear die-bent pieces.

Where plywood is used on exterior the walls have a double air space, the outer having an air circulation to carry away condensation moisture and the inner being filled with insulation. Interior surfaces are then either plywood or a special fabric-reinforced paper.

Road clearance of the wheel suspension unit is easily adjustable from 8″ to 16″. At rest, the spring action is locked out by a device operated by push buttons.

First floor design features: Annotations refer to numbers on accompanying plans.

1. Entrance door.
2. First floor is divided into a main cabin, 8′ x 17′-6″; a galley, 4′ x 8′; a bath, toilet and laundry, 2′-6″ x 8′.
3. Built-in seat, or bed. 4. Sliding shelf.
5. Space for books, radio, and so on.

6, 7. Smoking and magazine stands, cabinets, desks. The windows slide on a weather-strip tracking.

8, 9. Easy chairs of tubular lightweight alloy with sponge rubber cushions.

10. Wrap closet. (A door may be placed here for entrance into a sectional addition.)
11. Dresser and cupboards.
12. Drop-leaf dining table at which as many as seven may eat at one time. Floor in dressing room above gives full head height over the dining table area only. When the family is seated around the table the tallest may look across with vision unimpeded by this dropped ceiling.

13-19. Bentwood dining chairs.

20 (dotted lines). Engine may be installed here if it is desired to have the house self-propelled. This space may also be used for a small engine for generating power and pumping water, or it may be used for a locker.

21. Dresser. 22. Sink.
23. Ice or mechanical refrigerator.
24. Three-burner cooking stove with constant level valves. 25. Oven.
26. Burner to heat oven. By manipulation of dampers, heat from this burner may be sent about the oven or deflected through—
27. U-tube, into cabinet having—
28. Hot-air grill. This is in the upper horizontal face of the cabinet. Air enters through a grill near the floor and is heated by the U-tube. Circulation is increased by a small electric fan on very cold days.
29. Hot-water storage tank, through which smoke and heat pass from U-tube and oven to the roof.
30. Toilet, entered by a door from galley.
31. Tank, into which waste water from galley sink passes by gravity.
32. Pump or valve to flush toilet with waste water. 33. Lavatory.
34. Electric washer. 35. Wringer.
36. Twin laundry trays.
37. A 5′ alloy sheet metal tub with shower head. Bath, separate from toilet, is also entered by a door from galley. Foot-end of tub extends under washing machine which has motor mounted on side or above. Top fits over the laundry trays, making them usable as a dresser; above are built-in cupboards.

Second floor design features: One goes up the steps (a, b, c, d, e) of the ship's ladder with hand rail, near the entrance, to a level (f) where there is full headroom. This room may be used as a lounge. The drawings show its use as a dressing room. The two sleeping cabins have 4′-4″ headroom, sufficient for getting into and out of beds. They are two steps (g and h) above the floor of the dressing room.

38. Dresser. 39, 40. Closets.
41, 42. Beds 42″ wide, each large enough for two persons, if necessary.
43. Tank for fuel oil, filled from outside.
44, 45. Space for child's bed and chest of drawers, made of boxboard, or for large bed.
46. Lavatory. 47. Smokestack.
48. Bed.
49 (dotted). Cupboard under bed, opening into the kitchen.
50. Bed.
51. Compressed air storage tank.
52. Space for pump for air and water.
53. Water storage tank which feeds by gravity or pressure.
54-56. Roof ventilators. From 54, emergency exit from second story may be made easily by sliding down the back of the house.

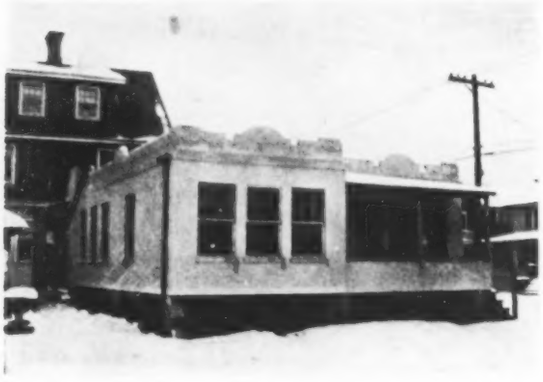
Ventilation: Although the portholes are also designed to slide open, it is probably preferable to keep all windows closed and to control the ventilation summer and winter by means of floor and roof ventilators. Floor ventilators may be built with adjustable air-scoops which will deflect upward the cool air from beneath the structure. The hot air inside flows out through the roof ventilators.

Utilities: A mixture of water and compressed air, chiefly the latter, is used for washing dishes, bathing, and the like. Less than a pint of flush-water is required by the toilet. All fixtures in the house are connected to a utilities coupling, the designer's own invention. Five utility services—electricity, water, telephone, gas, sewage disposal—are quickly and easily made available through this coupling.

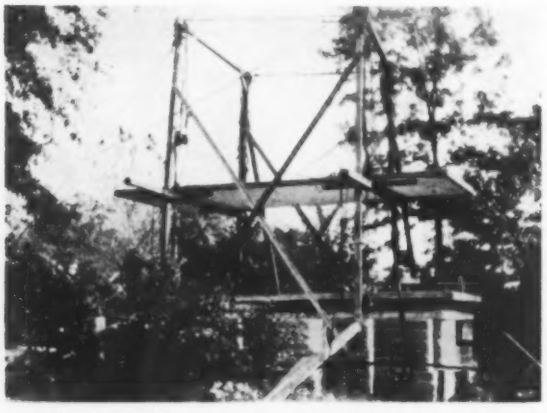
Economic mobility: As Corwin Willson points out in an unpublished manuscript of his book, "Living on Wheels," conditions of industrial employment have brought about a seasonal migration of large numbers of people. Consequently, the problem of shelter comes to include adaptation to an increasing degree of enforced mobility. The mobile house, he believes, makes home ownership possible without incurring a loss in economic freedom.

1920-22

Back in 1922 completely prefabricated concrete structures—measuring 12′-6″ by 28′-6″ in plan and including floor and roof as well as walls—were produced from designs by Robert C. Lafferty, architect. The photograph shows a strength test of 31,000 pounds on one of these early prefabricated house units.



This dwelling was erected under the New York City Building Code in 1922. It consists of two structural units of the kind shown in the strength test photograph. The units were manufactured complete in the plant and transported more than 30 miles to the site.



Another pioneer scheme by Robert C. Lafferty consisted of separate precast slabs for walls and floors erected in place on the site. Fourteen years ago adequate mobile cranes were not available, and a gallows frame with chain blocks had to be erected for the placing of the 3-ton slabs. Such slabs can now be easily placed with the new 8-ton automobile cranes. Where in 1922 it took 4 days to assemble a house, only 4 hours would now be required.

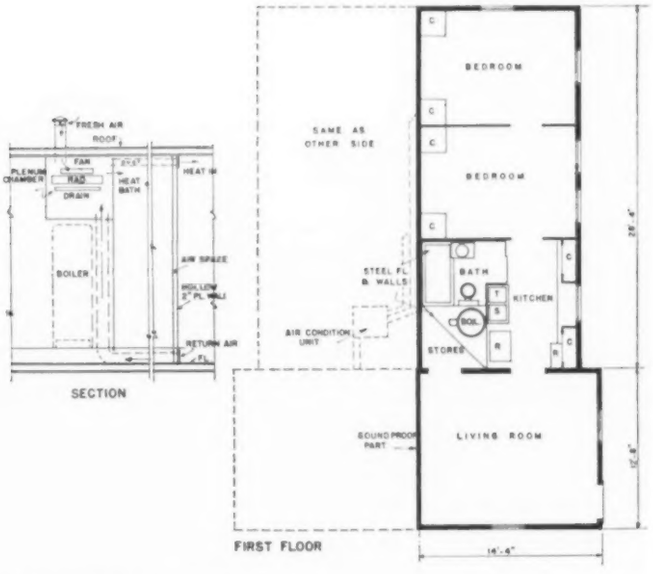
1936

FRONT ELEVATION

SECOND FLOOR PLAN

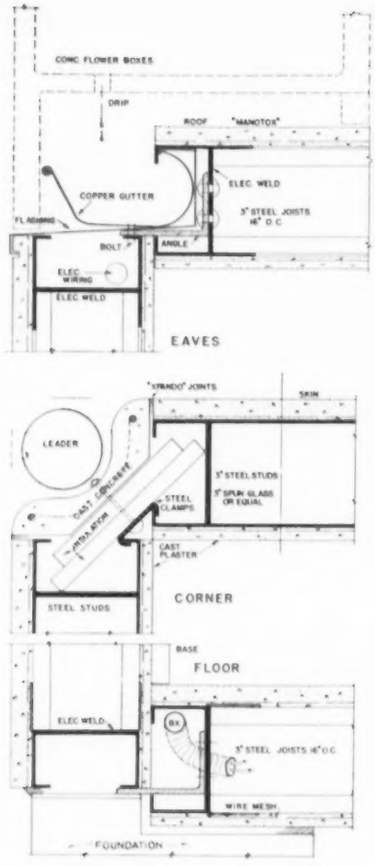
FIRST FLOOR PLAN

2-story 5-unit house
Robert C. Lafferty and Jack G. Stewart, architects

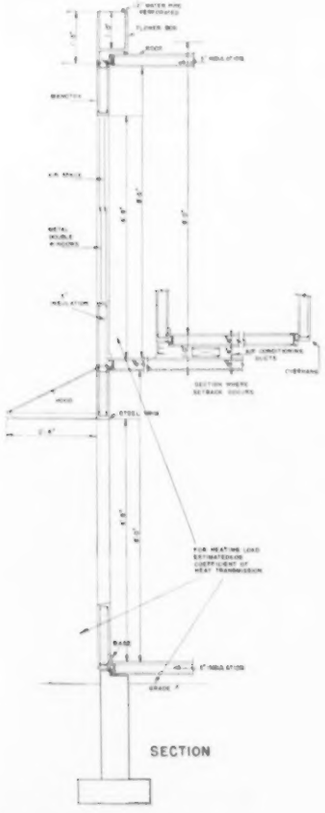


2-family 3-unit house
Robert C. Lafferty and Alan Wood Fraser, architects

NEW DESIGNS BY A PIONEER PREFABRICATOR



wall construction details



two-story set-back assembly

As long ago as 1920 designs were made by Robert C. Lafferty, architect, for the prefabrication of unit dwellings. A plant was set up and large concrete panels were manufactured. Complete dwelling units were assembled in the shop and transported as single pieces to the site, where they were placed on foundations. Seven houses representing this pioneer effort of prefabrication were erected, some in New York City.

During the last 12 years Mr. Lafferty, who has practiced architecture since 1899, has devoted his time largely to the development of an airway rail transport system of which he is also the originator. Recently, he has renewed his studies of prefabrication and has devised numerous improvements, on which he has applied for patents. Essentially a new structural system has been developed. Plans are now under way for quantity production of houses utilizing this construction within the near future.

Original prefabrication (1922): The early structural system consisted of a light reinforced wood frame to which concrete was cast over removable cores. The wall thus had an outside surface 5/8" thick and an inner surface 3/8" thick, with a weather-tight 3½" air space in between. The slabs measured 12'-6" x 28'-6". There were difficulties in making these concrete slabs and also in joining them to each other, but recent inspection of several dwellings after fourteen years of use shows that they may be confidently expected to last for many years to come. The heat transmission coefficient of the walls and roof of this early construction is approximately 0.497. New standards of efficiency stress the desirability of smaller heat loss and the use of less wood in connection with the concrete.

New fabrication: Steel is substituted for wood in the assembly, and the outer and inner concrete wall surfaces are cast and cured at different times. An interval of several hours between castings permits electric wiring, insulation, window units, and the like, to be placed conveniently. Slabs for floors, walls, and roofs are made to fit a standard unit floor area measuring 12' x 28'. In fabricating the slabs the first step is the preparation of a rust-proofed steel grid, consisting of an electrically welded 3" steel I-beam frame with 3" steel joists 16" o.c. Wire reinforcing is then attached to the grid and the assembly is placed on a 5/8" casting of dense vibrated concrete which has been spread upon a large palette in the shop. This exterior casting is then cured. The next step is the placing of electric wiring and insulation between the joists and the attachment of reinforcing for the interior finish. The whole assembly is then inverted and placed on a 3/8" spread of concrete or plaster prepared in the same way as the exterior casting.

In addition to permanence the slabs offer waterproofness, fireproofness, and protection against vermin and termites. The insulated structural unit, with double windows, has a heat transmission coefficient of approximately 0.09 and requires only 23,000 B.t.u. an hour in zero weather.

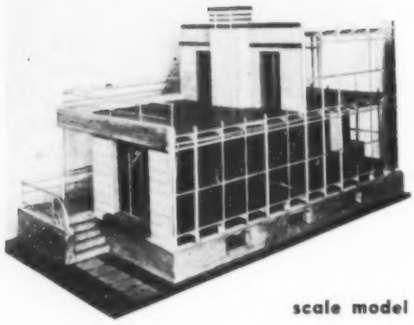
Structural assembly: The exposed steel frames at the ends of the concrete slab units permit slab connections to be made in a steel to steel assembly with dependable speed and certainty. There are no joints except those at the corners. A special cast concrete detail carries the exterior concrete finish around corners. Its design permits corner downspouts to be recessed within the building line; roof gutters are set back similarly, as shown in the accompanying detail drawing.

Plan combinations: Numerous designs have been made by Mr. Lafferty to show that his present 12'-8" x 28'-8" module unit is an aid in planning dwellings of from three to twelve rooms. The unit can be divided into separate rooms; for this purpose a 2" hollow interior partition is used to save space. Two or more module units can be joined or superimposed to form as large a structure as necessary with any desirable variation in exterior design. Set-backs and overhangs, which are otherwise difficult to construct, are easily obtained since each structural unit acts integrally. A 4" space for air conditioning ducts separates the second story floor slab and the first story ceiling slab (see detail).

Complete freedom is had in the size and placing of windows and doors. Stair wells can likewise be framed in the slabs without difficulty.

The accompanying plans of residences illustrate the flexibility of design which is inherent in this module system. Usable roof terraces, sun decks, covered verandas, are easily provided.

Cost: Experience, bids, and cost analyses indicate that a comparatively inexpensive fabrication shop can produce the parts for four dwelling units a day and that, with present available transport and placing equipment, it is possible to deliver and erect complete structures from $1,525 upwards. A specific 5-room house design, using a two-unit plan of this system, is estimated to cost $3,442.74; the identical plan and cubic content, in ordinary wood frame construction, is estimated by the contractor to cost $4,519.01.



scale model

This system was recently described by its inventor, Harry Cole, structural engineer, before the St. Louis chapter, A. I. A. It covers only the skeleton framework, exterior veneer walls, and the floor construction. The house design, interior finish and other features are determined by the individual architect. Patent rights are privately controlled by the inventor, but specifications and details are available without cost for the information of architects through Haco Construction, 100 N. Broadway, St. Louis.

The construction system is essentially a steel skeleton framework made up of structural elements, closely spaced, with all parts welded together. The exterior wall veneer is a part of the structure and acts as a composite unit with the steel angle ribs under flexure.

Haco stone slab: An architectural cement tile, inclosed within a steel channel frame and precast with all its reinforcing elements in one mold, is used for the outside wall veneer. A special mixture of cement and aggregate, color and integral waterproofing, is used to form the artificial stone. Reinforcing wires are part of the channel frame, only 2" deep, and serve further to reinforce the slabs, which are 1¼" thick; in all, the slab element is 3" deep, including the steel encasement and concrete veneer. The slabs are impervious to moisture and are strong both in tension and compression.

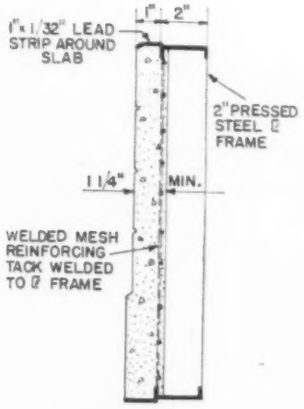
Wall units: The stone slabs are welded to wall units composed of vertical ribs made of structural steel angles. Window and door frames are also fastened to the units at the shop, after which they are ready for shipping to the job. The wall units are made of convenient sizes for shipping and handling. They are one story in height and about 10 or 12 feet wide. They weigh about 1,500 to 2,500 pounds each, and are erected in the field by the same contractor with proper hoisting apparatus.

Joints: The slabs are joined in the shop by means of a thin sheet lead binding wrapped around the edges of each individual slab. The vertical joints are made tight by lead caulking applied in the field.

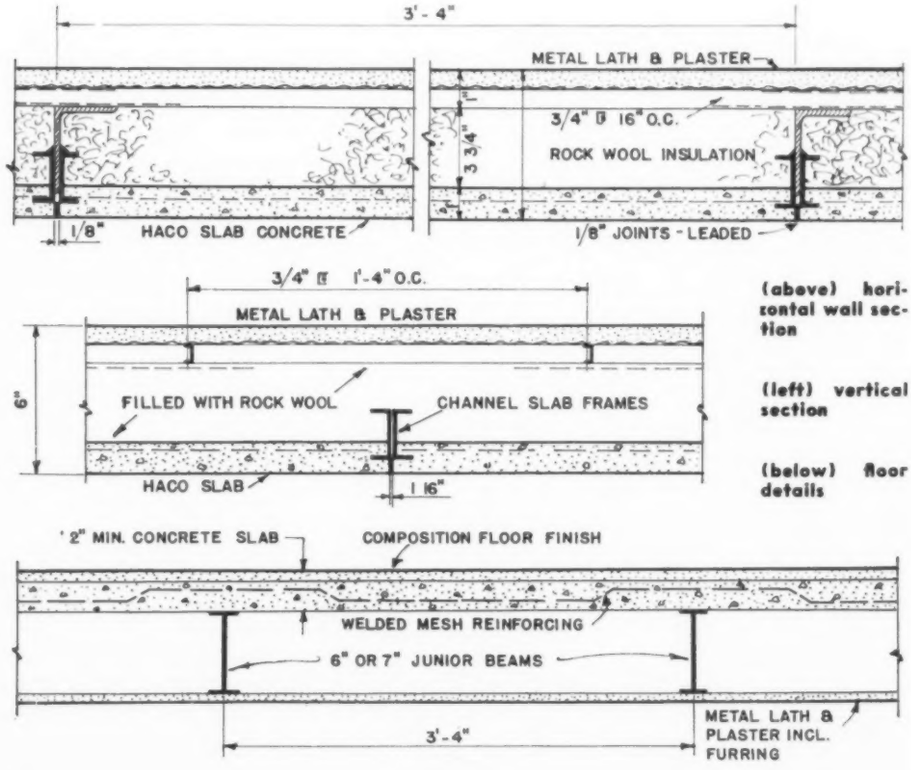
Floor construction: The vertical ribs of the wall units serve as studs to which the floor beams or joists are framed and welded. The floor joists are junior steel beams, also erected and placed by the same contractor. Each joist frames to a stud, making a framed bent construction of structural steel with an inclosing structural exterior wall slab, all acting together under all horizontal loads and all superimposed gravity loads.

Wall insulation: Between the studs a blanket insulation, which must be fireproof, is placed by hand and clipped so that the air space is entirely filled. With a wall consisting of 1½" precast concrete slabs, 3" thick Rockwool bats, metal lath and plaster, the thermal transmittance is 0.071 B.t.u. This heat loss is roughly one-fourth that of a 12" brick wall.

Cost: Actual quotation for a small house, including everything, runs $.65 a square foot for a wall complete in place.



section of Haco stone slab measuring 3'-4" wide and 5' high



(above) horizontal wall section

(left) vertical section

(below) floor details

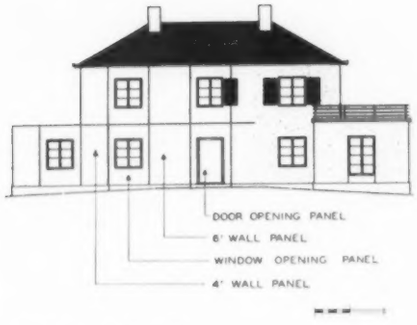
MILLER UNITS . . . . . PRECAST CONCRETE

A system of precast concrete units for floors and walls has been developed by Henry Luehrs Miller, architect and builder, Nashville, Tennessee. Manufacture and design are patented. Plans are now under way for the construction in September of a house employing this system.

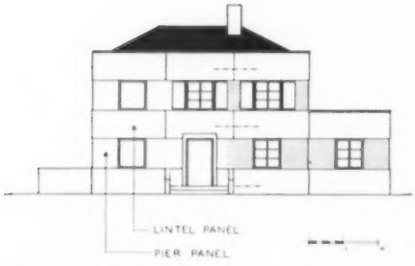
Two materials are used in construction of the Miller units. A high strength reinforced concrete (150 pounds per cubic foot) forms the structural load-bearing frame and provides a finished exterior wall surface for protection against weather. A lightweight porous concrete (45 pounds per cubic foot) serves as insulation against heat, cold and sound, and provides an acceptable interior wall surface. The wall in place weighs 42-66 pounds a square foot.

Wall units: Three types have been designed for the construction of single houses and large-scale housing projects. (1) Quarter-story units measure 2'-4" in height and 4' in width, and are erected in horizontal courses. (2) Half-story units measure 4'-6" in height and run in 16" multiples in width; they are erected in pier and lintel courses. (3) Full-story units measure 9' in height and 4' or 6' in width, and are erected in vertical courses. Wall thicknesses are 6" and 8".

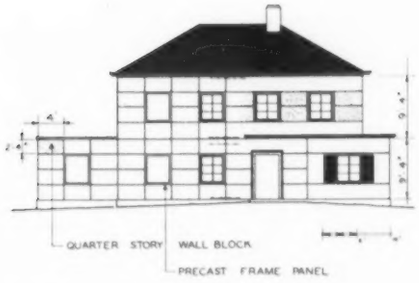
Wall assembly: Units are precast complete with all frames at the casting plant or at the building site. They are handled and erected on the job with light standard construction equipment and with a minimum of high-priced labor. Vertical joints between wall units are closed with field-cast reinforced concrete columns. Together with the floor slabs or unit floor panels these columns form a monolithic structural frame.



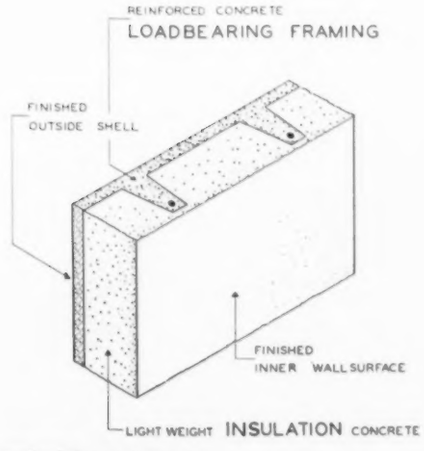
full-story wall units



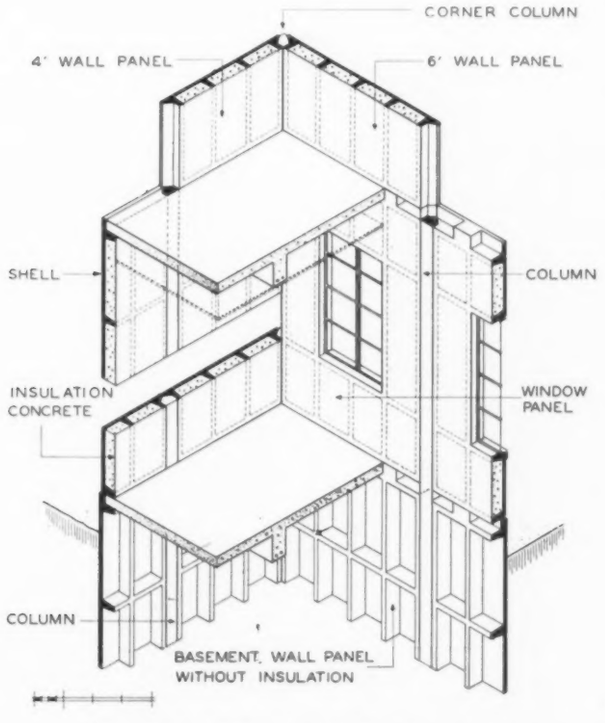
half-story wall units



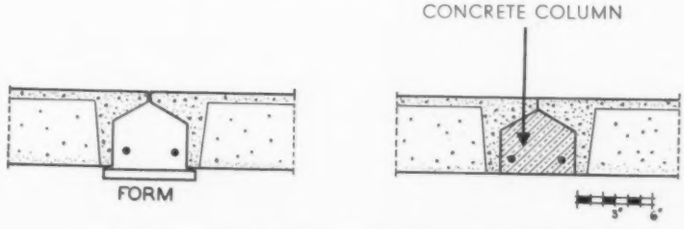
quarter-story wall units



material combination



isometric drawing of full-story wall units



columns are cast in place at juncture of wall units

SECTIONAL HOUSE DEVELOPED IN GERMANY

steel sections being joined in place

windows are built into the panels

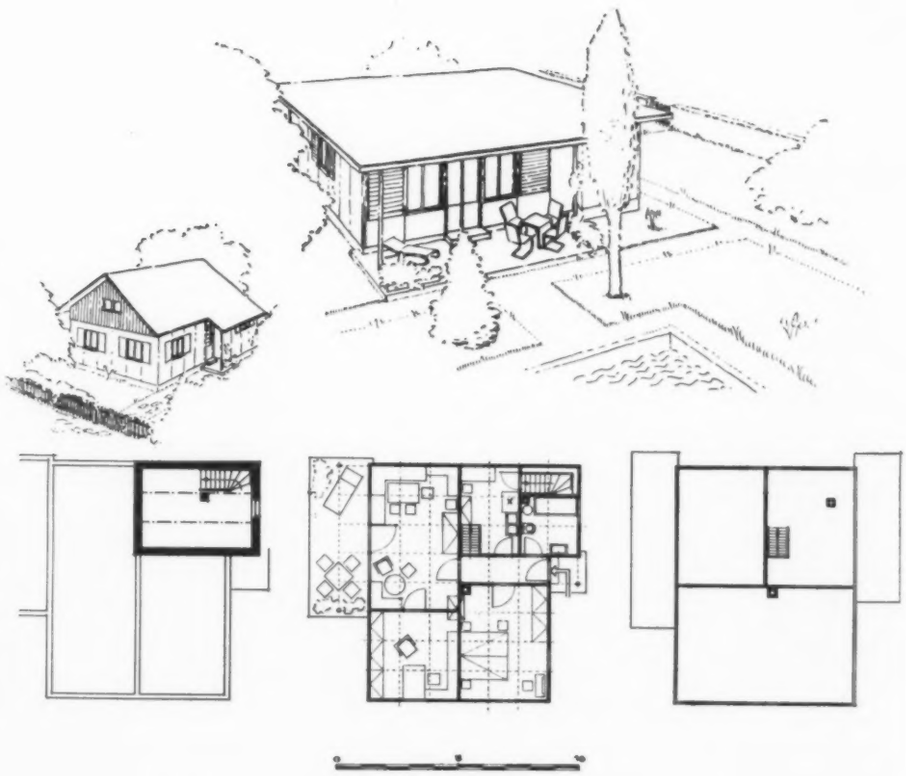
3-room house completed within 2 days

A new type of structure made of sections of insulated steel sheets has been developed by Dr. Ludwig Kletzin (Berlin-Frohnau, Specstrasse 33), a member of the Stahlwerks-Verband. Houses employing this system have already been constructed in Germany. A 3-room structure was completed within two days with the help of a few unskilled laborers and a fitter. The cost was 15% cheaper than a comparable construction in brick. Introduction of the product into the United States is desired by the inventor, according to a report by the Berlin office of the U. S. Department of Commerce.

Unlike other steel panel systems, which require separate operations for erecting the steel frame, attaching the sections on panels, applying insulation, finishing the interior surfaces, and installing windows and doors, the Kletzin system employs panels which are completely prefabricated and ready for immediate assembly. These sections which form the house measure 1.22 by 2.75 meters (4 feet wide, 9 feet high) and weigh 80 kilograms (17.6 pounds) each. Windows and doors are built into some of the sections.

Panel construction: On a steel sheet, 1/16" thick and reinforced with steel angles, are placed three layers of corrugated pasteboard which are stretched and kept apart by means of wood lath. Over this insulation is placed another steel sheet, likewise 1/16" thick, which is then covered by a 15 mm. (0.59 inch) plate of insulite. The whole panel is sealed together hermetically. The exterior metal surface is painted; the interior surface of insulite can be painted or papered.

Structural system: All panels fit together in a tongue and groove arrangement, and are sealed by felt strips. The outer grooves are puttied. Partitions and ceilings are similarly formed with interlocking panels. According to the inventor, the walls are termite-proof, soundproof, and have the same insulating value as three layers of brick.



NATIONAL HOUSES, INC., BEGINS PRODUCTION

Rembrandt Studio

model house sponsored by the Joseph Horne Co., Pittsburgh department store

Brown's Photo Service

demonstration house under construction at Old Greenwich, Connecticut

2-story house, sponsored by Modern Age Furniture Company, on display at 39 Street and Park Avenue, New York

Active production of houses made of prefabricated steel panels has been started by National Houses, Inc., New York. The structural system has been developed by William Van Alen, architect of such well-known structures as the 77-story Chrysler Building. Manufacturing plants have been established in Long Island City, Brooklyn, Cleveland, Pittsburgh, and Chicago, and the program of distribution calls for an immediate setting up of a hundred or more dealer agencies throughout the entire country. Some 20 agencies have already been established in key cities, and model houses are now being erected by these dealers, generally in collaboration with local department stores.

National houses are assembled from standard panels 2′ or 4′ in width and 9′ in height. These panels, which include door, window, corner and plain units, form the frame and outer face of the building. They are formed so that when fastened with structural clamps no other frame is needed.

Construction drawings are not obtainable, but the following paragraphs give an over-all description of the structural system.

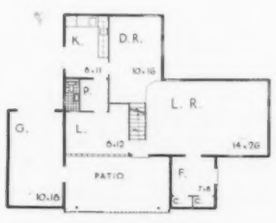
Foundations and floors: Anchor bolts for panels are set in the foundation walls, which are generally waterproofed poured concrete extending below the frost line, though other types of foundations may be used optionally. The first floor ordinarily consists of 6″ of insulating and waterproofed concrete on tamped earth, with 2″ of insulating nailing concrete which can be used as a finished floor or to which other finishes may be applied by using mastic or nails. The second floor is composed of combination floor and ceiling units; the floor surface may be finished in any material as desired and the under surface of the unit, which forms the ceiling of the story below, is ordinarily painted or papered, without plastering.

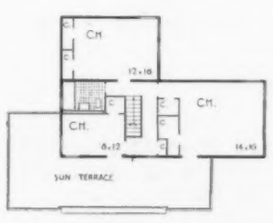
Walls and finishes: Exterior walls are 4″ thick with the sheet steel panels forming the outer face and with steel sheetrock or other wallboards forming the inner surface. A space of 3½″ between the two wall surfaces is filled with a patented mineral insulation equivalent to approximately 52″ of brick wall, according to tests made by the U. S. Bureau of Standards. All steel parts are treated with two coats of rust-inhibitive primer and all concealed surfaces with National rustproofing compound. The exteriors of National houses are covered with a special finish applied with a paint gun, which gives the appearance of a fine-grained stucco.

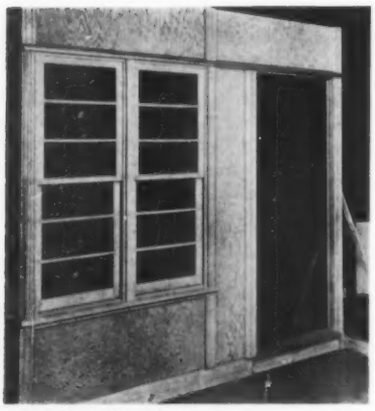
Roofs: Sloping roofs, if desired, may be included in the assembly: these consist of 2′ wide sections running vertically to the ridge and are insulated. Flat roofs are composed of a combination roof and ceiling unit joined together with structural clamps and covered with 4½″ of National insulating roofing. Flat roofs may be finished, if desired, as sun decks with a cement surface.

House designs: The floor plans are not standardized. Houses are individually designed to fit the special requirements of each purchaser. Floor plans can be prepared by a local architect, if desired, and then turned over to a local National dealer for fabrication. Any size house with any number of rooms may be assembled, provided dimensions are in multiples of 2 feet. Partition walls may be spaced as desired. Houses up to four stories in height may be built. The assembly work is done by crews of local workmen specially trained. The time required for assembly and delivery of a National house is said to be one-fourth that of traditional house types.

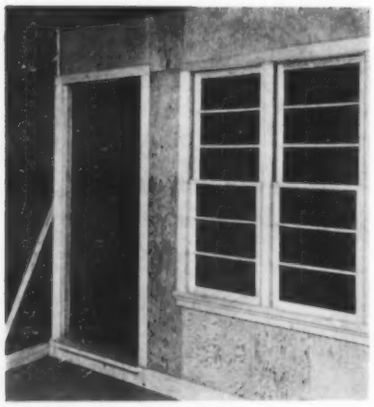
Costs: The prices of National houses vary because of local conditions, distance from points of fabrication, variations in utilities, and other factors. No fixed price is quoted. Company officials, however, state that the National house can be sold at a price lower than an ordinary well-built wooden houses of the same size, containing the same equipment. National houses have been approved by the Federal Housing Administration.







exterior of wall section



interior of wall section

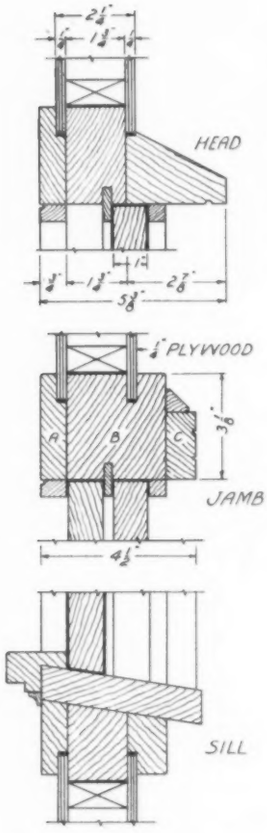


figure 1—window details

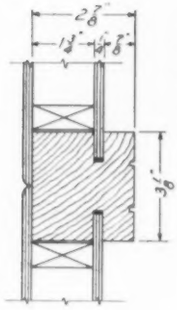


figure 2
connection of two wall panels and mullion

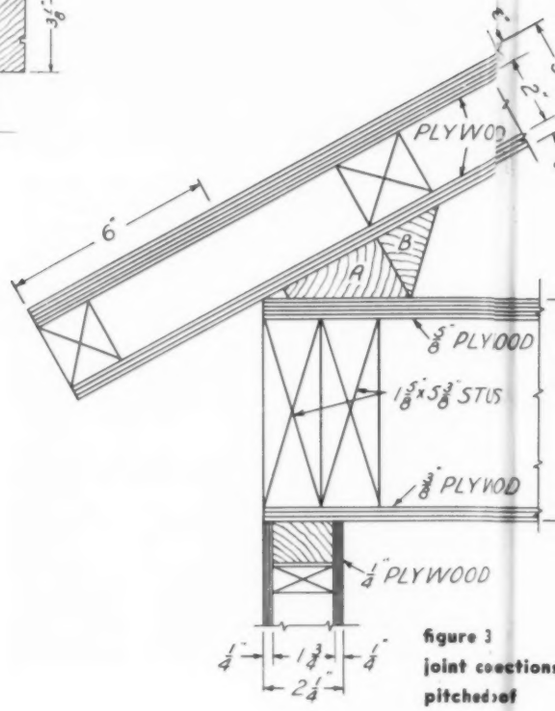


figure 3
joint coection
pitched of

ALL-WOOD PANEL SYSTEM OF PREFABRICATION . . . . . .

As a part of its research program, the Forest Products Laboratory (maintained at Madison, Wis., by the U. S. Department of Agriculture in cooperation with the University of Wisconsin) designed and built last year an experimental prefabricated house in which plywood was the principal material of construction. This house was a one-story type with flat roof and casement windows. (See "Prefabrication with Wood," THE ARCHITECTURAL RECORD, August 1935, pages 102-106.) Like most prefabricated structures, the house had as its basic structural unit a panel. This panel system can easily be altered to permit many types of construction. As an illustration of its flexibility of design a new wall section including double-hung windows was recently constructed and is described here for the first time by R. F. Luxford, engineer, and August Smerda, Jr., junior forest products technologist. Details of design whereby panel construction can be used for two stories and pitched roofs are also shown.

With this system of wood prefabrication, each panel consists of two plywood faces glued to both sides of an inner structural framework to form what is virtually a box girder. The load is immediately distributed through the framework to the plywood faces so that the joists or studs actually support only about one-quarter of the bending load. This action is possible because of the complete and continuous rigid joint formed by the glue between the plywood faces and the framework.

New wall section: The over-all thickness of the wall panel is 2¼". The window sash are only one inch in thickness whereas the minimum thickness in usual commercial windows is 1⅜". For relatively small windows, however, they should prove satisfactory with reasonable care in manufacture. Details of these windows are shown in figure 1. The weight pockets were eliminated by the use of one of the new types of window balances.

Each vertical mullion forming part of a door or window frame has two parallel grooves into which the edges of the plywood panels are fitted as shown in the sketch of the side jamb. The part marked "B" is 2⅞" by 3⅛" in cross-section. This part is continuous the full height of the wall panel, and carries the load from the floor above to the foundation. The parts marked "A" and "C" are necessary to give the required thickness of frame to accommodate double-hung windows and storm sash or screen. Hardwood rather than the usual soft pine is used for the center parting strip, thereby permitting a thinner piece which reduces the required over-all thickness of the window frame. The door frame has the same over-all thickness as the window frame and is sufficient to accommodate a 1¾" inside door. There is also space for a 1" screen door provided the inside door is equipped with a special short knob.

The mullion at the junction of the two panels extends from the unexposed face of the interior plywood to ⅞" beyond the outer face as shown in figure 2. Consequently no part of the mullion extends into the room and hence the edges of the plywood sheets are adjacent to each other. This arrangement eliminates the batten-strip effect and the edges of the panels can be rounded.

Since the mullions do not project into the room it was necessary to extend them ⅞" beyond the outer surface of the building in order to obtain mullions of

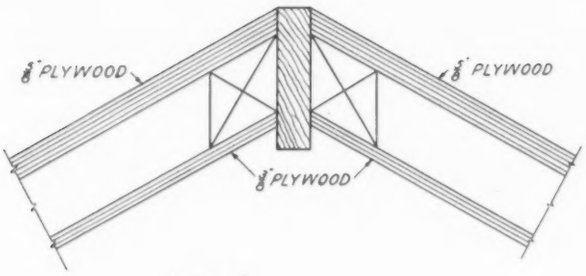
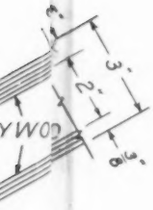
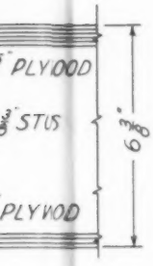


figure 4
connections of roof panels at ridge board





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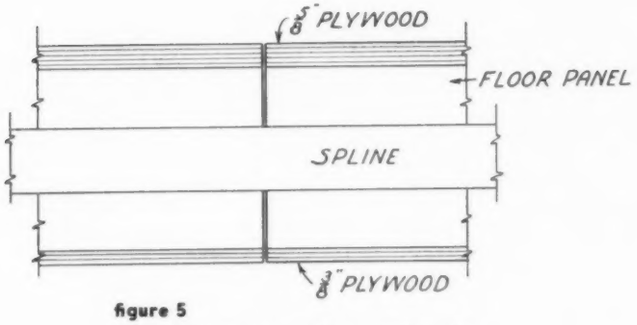


figure 5
tie between two floor panels by means of a spline securely nailed to resist horizontal thrust

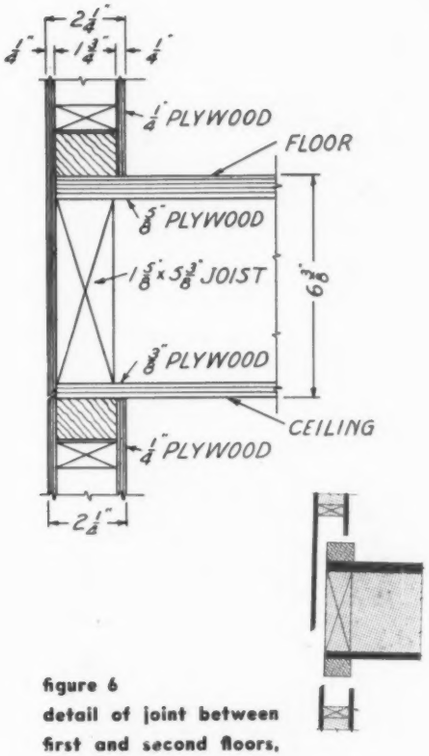


figure 6
detail of joint between first and second floors, consisting of three separate assemblies

. . . . . DOUBLE-HUNG WINDOWS, PITCHED ROOFS, 2-STORY HOUSES

sufficient size to support the floor loads. (This gives the appearance of greater structural strength.) By filling the wall opening, which is 1¾" wide, with a loose insulating material a wall very resistant to the transfer of heat or cold is obtained. In fact, it is somewhat better than the conventional type of construction consisting of wood siding, wood sheathing, paper, lath and plaster, plus ½" of blanket insulation. A house constructed of plywood panels is also more resistant to air infiltration than the conventional construction because there are no cracks through which the wind can pass.

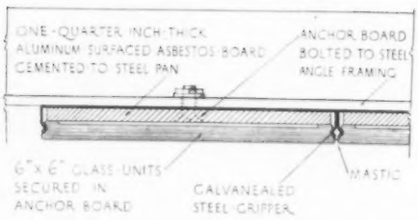
Pitched roofs: Houses with pitched roofs can be easily constructed with the type of panels employed by the Forest Products Laboratory. Figure 3 illustrates a suggested joint between the roof and attic floor panels. This joint consists essentially of a triangular strip "A" approximately 2" by 3" by 3½" in cross-section securely nailed to the top story ceiling panel, and a triangular strip "B" approximately 2" by 2" by 2¾" in cross-section securely nailed to the roof panel. After the roof panels are assembled strip "B" bearing against strip "A" keeps them firmly in place. When the erection is completed strip "B" is nailed to strip "A" to prevent the roof from being lifted by heavy winds. The connection at the roof board is the conventional type, as illustrated in figure 4.

The thrust exerted by the roof loads must be resisted through the floor panels. Since the panels are not continuous from roof line to roof line but extend only from one roof line to a bearing partition, it is necessary to have a tie between the panels. Splines are used between all panels to cause them to deflect together under load. Through adequate nailing these same splines are utilized to obtain the proper tie in the direction of the thrust. The placement of the splines is shown in figure 5. The splines extend ½" into the floor panel joists and are 1⅞" high.

Two-story houses: It is both practical and feasible to erect two-story houses with prefabricated panels as constructed by the Forest Products Laboratory. A connection between the first and second stories at the outside wall is shown in figure 6. This figure includes portions of the wall of the first floor, the floor panel between the first and second stories, and a portion of the second-floor wall.

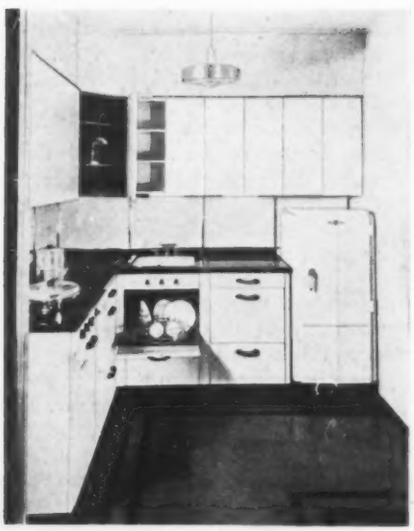
Essentially the construction resembles the platform type of conventional frame construction in that the second-story floor panel rests upon the first-story wall panels and the second-story wall panels are placed directly on top of the floor panels. The wall panels are grooved by extending the plywood faces beyond the edges of the framework 1¼" forming a groove 1¼" by 1¾". A strip which will exactly fit this groove is nailed to the top and the bottom of the floor panel along its outer end, and the wall panels are fitted over these strips. The second-story wall panels differ from the first-story panels in that the outside plywood face is extended sufficiently beyond the framework of the wall panel to cover the exposed end of the floor panel. After erection this extended portion of the outer plywood face is nailed to the floor panel to tie the two units securely together. The tie between the first-story wall panel and the floor panel is accomplished by nailing together the plywood faces and the strip fitted into the groove of the wall panel.

The joint between the outside plywood of the first and second stories is cut at an angle to shed the water.



glass tiles anchored to steel framing

roof ventilator without moving parts



standard units for flexible kitchens

gripper frame for glass tiles

Introduced by Sealed Joint Products Co., 30 Rockefeller Plaza, New York. Used for first time in Schenley Tower Building, Times Square. In the new Mid-Town Tunnel, under the Hudson River, the Port of New York Authority, as a licensee, is now installing 800,000 glass units which will form the largest glass ceiling in the world.

The gripper, a non-corrosive metal frame that snaps over the edges of glass tiles, makes it possible to build with glass under trying conditions of stress, vibration, heat, cold, and moisture.

On the Schenley job, the grippers differ somewhat from those to be used in the tunnel. They consist of No. 22-gauge bronze channels with spring clip edges which grip the tile. Masonite *Quartrboard*, painted with aluminum bakelite varnish to increase the reflectivity of the glass, is laid in the channels. The *Quartrboard* is bolted to the frame or wall, and the glass tile is then set in the gripper and the joints painted with mastic.

Ceiling units of the tunnel are to be cast on the underside of a concrete slab. Metal forms carry a layer of wallboard or plywood covered with gummed paper on which the units are set face down. The gummed paper, when moistened, holds the tile in place while reinforcing is being set and concrete is poured over the backs of the grippers. After the forms are removed, the gummed paper is washed off the face of the tile.

year round air conditioner

Manufactured and marketed by The Trane Company, La Crosse, Wis.

The "Airite," a conditioner of the direct-fired oil-burning type, is intended for residential installations. In the winter, automatically controlled heat is provided. In summer, cooling is accomplished by standard Trane cooling coils using either cold water or direct expansion refrigerants. The air is cleaned and humidified.

square water heaters

Five new models are announced by the Westinghouse Electric and Manufacturing Company, Mansfield, Ohio (Sweet's Catalog File 24/47). Capacities are 30, 52, 66, 80, and 120 gallons. These water heaters, with the 40-gallon already in the line, have been styled as the Empire line.

The square type exterior casing allows the heater to set flush with walls and cabinets of modern all-electric kitchens. Finished with high-temperature white Dulux, the new models harmonize with any color combination in the kitchen, or with the white refrigerator, range, or dishwasher. A fluted vertical panel on the front of the heater serves as a cover plate for the heating element openings. All wiring and plumbing connections are made at the bottom of the heater. A special recessed front base panel provides toe space.

free-flow gravity ventilator

Developed by The Burt Manufacturing Company, Akron, Ohio. (Sweet's Catalog File 9/12)

Traditional design has been disregarded in this stationary unit. The entire discharge is vertically upward. There is no discharge under the windband. Internal louvers which would tend to impede the flow of air have been eliminated. An oversize drain trough and tube carry away all rain, snow and refuse which fall on the ventilator top. The construction is free of moving parts.

copper coating

Introduced by American Coppercote, Inc., 480 Lexington Avenue, New York.

"Coppercote" is pure metallic copper which can be applied with a brush to iron, steel, wood, concrete and other surfaces, including metals already rusted. It is not a paint, but a liquid composition of fine particles of copper which are held in suspension in the vehicle until used, when they immediately combine and adhere not only to the base surface but also to each other, thus forming a continuous protective sheathing of copper. Simultaneously the liquid vehicle rises to the surface and forms a protective film over the copper, permitting a limited range of colors. The product is quick-drying and quick-hardening. The sheathing is said to be corrosion-proof, water-proof and fire-resistant.

unit kitchen equipment

Announced by appliance and merchandise department of General Electric Company, Nela Park, Cleveland.

The individual units, which include the electric refrigerator, electric range, electric dishwasher and kitchen cabinets, can be arranged in any manner desired. They can be set side by side along a flat wall or in an L-shape. The units are based on a 2-foot module system and are interchangeable.

A new type electric dishwasher is used; it has a front-loading design, and a capacity sufficient to take care of a 50-piece service. Lighting equipment is built-in. Work surfaces are of black porcelain on steel and they are resilient. Shelves in the cabinets are adjustable. The construction is all steel.